THE IRON TRADE REVIEW

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WARM WEATHER

STIMULATES BUYING OF FINISHED PRODUCTS

And Has Depressing Effect on Coke and Scrap—Pig Iron Not So Strong in Central West.

The long continued mild weather is having important effect upon the market. It has greatly stimulated the demand for some finished materials, especially wire products and materials used in building operations. On the other hand, it has made the coke and scrap markets very much easier. There is also a decreased demand for bar iron.

Fig Iron Conditions. Conditions in regard to pig iron vary considerably in different selling centers, but on the whole the market is not so strong. While the demand is brisk in the east and has improved in Chicago, prices are somewhat softer in the central west, sales being freely made on a basis of $14 for No. 2 Birmingham and $17.50 valley for No. 2. Opinions differ somewhat as to the extent to which buyers are covered for the first half of the year, but it is evident that purchasers have provided amply for the first quarter and that the only ground for much difference of opinion is as to whether the buyers will need as large a tonnage as has been expected for the second quarter. The Steel Corporation has purchased 30,000 tons of Bessemer for second quarter delivery. It is understood that the prices to be paid will be the ruling market quotation.

Eager for Orders. An inquiry for a large tonnage of pig iron from the leading cast iron pipe interest developed unexpected eagerness to take the business and such a low quotation was made on No. 2 foundry that the buyer decided to cover for the month of April only and to await develoments before contracting for later months.

Crude Steel. The difficulty experienced some time ago in getting sufficient quantities of crude steel has disappeared to a large extent, but the demand for forging billets and wire rods is very strong in the Chicago district.

Concessions Withdrawn. Somewhat better delivery is being given on plates and a few mills complain that specifications are coming in slowly. The concessions heretofore made to users of tank plate on the Pacific coast have been withdrawn. The demand for sheets continues strong. The American Sheet & Tin Plate Co. has ordered that two idle mills be started this week.

Coke Prices Decline. The prices of coke are much easier, purchases having been made for prompt shipment at as low as $2.20 for furnace coke and $3 could probably be shaded for foundry coke. Quotations on scrap continue to decline.

Farmers are Busy. Many miles of fences are being built and repaired by farmers and the demand for wire products is exceedingly active with buyers pressing for delivery.

Heavy Orders in Sight. Labor troubles have caused some hesitancy in the placing of orders for structural shapes, but a large amount of new business is in sight. The new Field Museum at Chicago will require about 12,000 tons; the Cook county building 8,000 tons, and two Chicago office buildings, for which contracts have been awarded, from 800 to 1,000 tons. The demand for railroad bridge material continues to be an important factor in the business of the American Bridge Co., one contract in the last week being for 1,400 tons for the Lake Shore. Mild weather has made it possible for the laying of pipe and heavy business is being done. The Ohio Fuel Supply Co. made a contract for 85 miles of line pipe and the Union Oil Co., of San Francisco, for 50 miles to be laid on the Isthmus of Panama. Among the contracts for cast iron pipe were 6,500 tons by St. Louis, 1,500 tons by Minneapolis and 800 tons by Bismarck, Dak.

REPUBLIC APPOINTMENTS.

(Special Telegram.)

Pittsburg, Jan. 24.—Charles Hart, general manager of the Republic Iron & Steel Co., with headquarters at Youngstown, has announced the following appointments and changes:

J. W. Deetrick, general superintendent of the valley plant and northern furnaces, becomes district manager with his supervision extending over the Brown-Bonnell, Bessemer and valley plants at Youngstown, the Sharon plant and the Hall furnace at Sharon, the Atlantic plant at New Castle, Haselton and Hannah furnaces at Youngstown and two new furnaces at Haselton.

Peter J. Gordon, superintendent of the Bessemer plant, becomes superintendent of both the Bessemer and Brown-Bonnell plants.

Harry Parrock, superintendent of the Brown-Bonnell plant, becomes assistant superintendent of the two plants.

The executive, operating, and auditing departments of the Republic Company, together with the headquarters of the sales departments will be transferred from Chicago to Pittsburg as soon as the new offices in the Frick building, in that city can be made ready, according to present indications about March 1. Charles Hart, general manager of the operating department, whose headquarters have heretofore been at Youngstown, O., will also be moved to Pittsburg. A sales agency will be retained in Chicago, but no one has as yet been named for that position.

LATE RAIL SALES.

(Special Telegram.)

New York, N. Y., Jan. 24.—Rail sales of the week include the following: Pennsylvania Railroad 50,000 tons, making the total for that road 230,000 tons; Atlantic Coast Line 10,000; Chicago and Great Western 5,000; small lots, about 15,000 more.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Prices of Coke and Scrap Softer—Decreased Demand for Bar Iron.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, January 23

Market conditions in this district remain about as they have been with the exception of a tendency toward softer prices in coke and scrap and a decreased demand for bar iron and billets. While the feeling regarding bar iron and billets has not been as general as in the other two commodities, there is nevertheless a belief that prices are not as strong as they have been for some time, this being due more to a decrease in the urgency of demand for them rather than any attempt to shade prevailing prices.

The pig iron market continues strong, with the possible exception of basic, which has not stood up with other grades of pig metal. The purchases of the steel corporation this year to date have been 90,000 tons of Bessemer, 60,000 for first quarter delivery at $17.25, valley furnaces and 30,000 for second quarter delivery, the price of which has been announced as $17.75, but upon which the price has as yet not been agreed upon. The Bessemer Pig Iron Association was not a party to the second quarter deal, but it is understood the seller divided with one of the other valley furnace interests. Malleable Bessemer has been strong and consumers have asked the selling interests to anticipate their specifications and ship ahead of contract time. Northern No. 2 foundry is being held at $18 valley. At least one Southern furnace interest has quoted $14 Birmingham, for prompt shipment, but others are holding at $14.25. Three furnaces were blown in during the week, two of them being new and never before in operation. These were the new No. 7 furnace of the Cambria Steel Co., at Johnstown, and new No. 4 furnace of the Carnegie Steel Co., at Mingo. Furnace F, at Edgar Thomson plant of the Carnegie Steel Co., was blown in last Saturday after relining. The Cambria furnace is on basic while the Carnegie furnaces are Bessemer. A detailed statement of improvements to be made during the year by the Carnegie Steel Co., in the Pittsburg district is as follows: Homestead, including the Carrie group of furnaces at Rankin; two new 22 x 85 foot blast furnaces, complete with all modern equipment and ore handling machinery, and having a combined capacity of 1,000 tons per day; ten 50-ton open-hearth furnaces, on the two level plan; raw material to enter over the Pittsburg & Lake Erie and Pittsburg, Virginia & Charleston railroads, by bridge over the Pennsylvania tracks that now run through the plant. Ingots will be taken out through a subway under the P. V. & C. tracks. Additions to the finishing capacity will consist of remodeling the 23-inch structural mill and the 35-inch structural mill and additional heating capacity to the 40-inch cogging mill, and the 72-inch sheared plate mill will be removed from Lawrenceville to Homestead and remodeled. At New Castle and Bellair the heating capacity will be increased 25 per cent and there will be some slight changes at the lower mills, Youngstown. At the Ohio Works, Youngstown, a new three-high blooming mill will be added. At the Edgar Thomson plant the company will replace the present blowing equipment at A, F, G, H, and I furnaces with modern blowing engines, put in new ore handling machinery at the whole eleven furnaces, remodel the blooming mill, and install a new engine in the converting mill of No. 1 rail mill. At Duquesne, the company will add a 250-ton metal mixer, remodel and reset the 26-inch roughing mill, 21-inch finishing mill and the 16-inch continuous mill and build a new bar mill.

In finished lines conditions which have prevailed for several months continue with a noticeable improvement in sheets, tin plate and wire products. During the week contracts for several large buildings, two in Pittsburg and one in Chicago, were let and a big building movement is anticipated with the opening of spring.

The United States Steel Corporation has advanced the price to consumers of fabricated material on the Pacific coast to a 1.60c base, the same as paid by domestic users. Heretofore, upon proof that material was sent direct to the Pacific coast before being fabricated, the Pacific coast users were given a 1.40c base price. The change is an advance to them of $4 per ton. The American Sheet & Tin Plate Co., announces it is now operating 90 per cent of its sheet and 80 per cent of its tin plate mills.

The National Tube Co., has sold to the Union Oil Co., of San Francisco, 50 miles of 8-inch line pipe to be laid across the Isthmus of Panama, under a franchise recently granted by the United States government. The Ohio Fuel Supply Co., with headquarters in Pittsburg, has placed contracts with the National Tube Co., and Spang, Chalfant & Co., for 85 miles of 18-inch O. D. pipe to complete its lines from the Knox-Licking county gas fields to Cincinnati. The line will be 135 miles long, 50 miles from Columbus to Xenia, O., having been already laid.

Pig Iron.—While on the surface transactions of pig iron have not caused much of a ripple, there has been a heavy undercurrent of buying, which has been done on the quiet in order not to disturb existing healthy conditions. There are one or two heavy inquiries in the market. The United States Steel Corporation has purchased 30,000 tons of Bessemer pig iron for second quarter delivery, but the price has not been determined. The seller has asked $17.75, valley furnace, but the contract will probably be signed at a figure below this. If this price is named when the contract is signed, there will probably be a condition to the effect that market prices for the months of the second quarter shall govern the sale. So far this year the corporation has purchased 90,000 tons of Bessemer pig iron, 60,000 for first quarter and 30,000 for second quarter. No further negotiations are on at the present time. The supply of Bessemer iron for first quarter is now in comparatively few hands and while it is possible that on 5,000 or 10,000-ton lots $17.50 valley furnace would be quoted the prevailing price for small lots, first quarter delivery, is $17.75. Prices on southern iron were a little weaker this week than last and quotations of $14 to $14.25, Birmingham have been made. Most of the southern furnaces are pretty well sold up for early delivery. Foundry, nothern has been fairly strong at $18, valley, and a sale of gray forge was made at $16.25, valley. Basic iron has not been as strong as Bessemer. We quote:

Bessemer Valley	$17.60 to 17.75
Bessemer, Pittsburg	18.45 to 18.60
No. 1 Foundry, Pittsburg	18.50 to 19.00
No. 2 Foundry, Pittsburg	18.35 to 18.85
Gray Forge, Pittsburg	16.70 to 17.20
Basic, Valley	17.25 to 17.50
Basic, Pittsburg	18.10 to 18.35

Ferro-Manganese.—While apparently the demand for ferro-manganese, foreign, 80 per cent, does not seem to be as sharp as it had been for the past month or six weeks there has been no weakening of the prevailing quotation of $175 for spot shipment. The steel making concerns which were caught short evidently have secured enough to carry them over and the frenzied conditions which were predicted about the holidays have eased off considerably. The large importers are not guaranteeing future delivery and reports from foreign agents are that ships entering the Black Sea for ferro-manganese are unable, on account of revolutionary disturbances, to secure cargoes. One ship has been waiting since October.

Skelp.—There has been no change since the last report and prices remain the same with comparatively little movement in skelp. Pipe mills are

busy, but have secured their raw material ahead and are not in the market for skelp to any considerable degree. We continue to quote: Bessemer, grooved, 1.65c to 1.70c; sheared, 1.70c to 1.75c; basic, grooved, 1.65c to 1.70c; sheared, 1.70c to 1.75c; iron, grooved, 1.65c to 1.70c; sheared, 1.80c.

Muck Bar.—With the market extremely quiet and no reported transactions during the week, we continue to quote a nominal price of $31.

Rods.—A nominal quotation of $37 to $38, mill, with the two leading producers entirely out of the market. A scarcity has been noted.

Plates.—Effective January 16, the United States Steel Corporation announced a change in prices of tank plates to the Pacific coast, amounting to an advance of $4 per ton. Heretofore plates cost the domestic user when placed into fabricated work and shipped to the Pacific coast the base price of 1.60c while, when shipped direct to the coast and put to the same use out there they cost that user only the 1.40c base. Under the new arrangement the user on the Pacific must pay the 1.60c base, the same as the domestic user. Aside from this change in price to the Pacific coast, conditions remain about the same as they have been for several months, with new business being booked steadily and but little prospect of better delivery although there are no indications of delivery getting farther behind than at present. Contracts for the material of three lake ships have been placed within the past week, but whether this is for ships already announced or for new work, is not known here. If this material is to go into ships not already announced, delivery of those ships, on account of the full condition of lake yards, could hardly be made before 1907.

We continue to quote: Tank plate ¼ inch thick, 6¼ inch to 100 inches, 1.60c, f. o. b. mill, Pittsburg. Extras are as follows per 100 pounds: Flange and boiler steel, 10c; marine, A. B. M. A. and ordinary fire box, 20c; still bottom, 30c; locomotive fire box, 50c; plates over 100 inches up to 110 inches in width, not less than 5c extra; plates 110 inches to 115 inches wide, not less than 10c extra; 115 to 120 inches, not less than 15c extra; plates 120 inches to 125 inches wide, not less than 25c extra; plates 125 inches to 130 inches not less than 50c extra; plates 130 inches wide, not less than $1 extra; plates 3-16 inch thick, 10c extra; gauges 7 and 8, 15 cents extra; No. 9, 25c extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States.

Sheets and Tin Plate.—The American Sheet & Tin Plate Co., has given instructions to start two idle mills during the week, they being the Star mills at Pittsburg and the plant at So. Sharon, Pa. New specifications on old contracts as well as new tonnage have been heavy at the advanced price and the leading interest is now operating 90 per cent of its sheet mills and 80 per cent of its tin plate mills, according to the latest statements. One of the largest independent makers has instructed its agents that the mills are sold up about as far as the company cares to go for the present, and this firm has been quoting 0.05c above the official list price of the leading interest. We continue to quote:

American Bessemer steel sheets, box annealed, cold rolled, one pass: Nos. 11-12, 2c; Nos. 13-14, 2.05c; Nos. 15-16, 2.10c; Nos. 17-21, 2.15c; Nos. 22-24, 2.20c; Nos. 25-26, 2.25c; No. 27, 2.30c; No. 28, 2.40c. Galvanized, Nos. 10-11, 2.35c; Nos. 12-14, 2.45c; Nos. 15-16, 2.55c; Nos. 17-21, 2.70c; Nos. 22-24, 2.85c; Nos. 25-26, 3.05c; No. 27, 3.25c; No. 28, 3.45c. Corrugated roofings, 1.70c per square for No. 28 painted, 2½-inch corrugation; 3.05 per square for No. 28 galvanized, 2½-inch corrugation. Quotations f. o. b. Pittsburg on large lots.

Merchant Bars.—The bar iron situation during the past week has not been as strong as it had been for some time past and the inquiries are not of such an urgent nature. The Republic Iron & Steel Co., is still quoting 2c Youngstown, equal to 2.04¾, Pittsburg. This price could probably be shaded a little with producers who are still looking for business; in fact 2c Fittsburg has been done, but not on large lots. The producers who are in position to supply promptly in good tonnages are holding to the price. We continue to quote:

Common iron bars, 2c, Youngstown; 2.05c, Pittsburg; hoops, 1.85c in carload lots, and 1.95c in less than carload lots, with regular hoop card for extras. Bands, 1.50c; Bessemer steel bars, 1.50c; open-hearth steel bars, 1.50c; plow and cultivator, 1.50c, net; channels, angles, zees and tees under 3 inches, 1.60c all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 10c advance; less than 1,000 pounds of a size, 30c advance.

Pipes and Tubes.—The first sale of pipe line so far this year has been made during the past few days, the Ohio Fuel Supply Co., having closed for 85 miles of 18-inch, O. D. line pipe, divided between the National Tube Co., and Spang, Chalfant & Co., of Pittsburg, for delivery beginning at once and extending to April 30. The National Tube Co., has also sold to the Union Oil Co., of San Francisco 50 miles of 8-inch line pipe to be laid across the Isthmus of Panama under a franchise recently granted by the United States government. The demand for merchant pipe has been extremely good and the conditions of the past six months continue with mills running practically to capacity and there is considerable talk of new improvements to increase the tonnage output. Quotations on iron pipe have been withdrawn by the leading interest and several independent makers except where it is necessary to accept the business to retain old customers. We quote.

	Steel		Iron	
Consumer's Carloads	Black	Galv.	Black	Galv.
⅛ and ¼ inch	71	55	67½	51½
⅜ inch	73	59	69½	55½
½ inch	75	63	71½	59½
⅝ to 6 inches	79	69	76	66
7 to 12 inches	74	59	71	55½
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	64	52	60½	48½
½ to 4 inches	71	59	67½	55½
4½ to 8 inches	67	55	63½	51½
Double extra strong plain ends, ½ to 8 inches	60	49	56½	43½

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel	Iron
1 to 1¼ inches	46	41
1½ to 2¼ inches	58	41
2½ inches	60	46
2¾ to 5 inches	66	53
6 to 13 inches	58	41

Less than carload lots two points less.

2½ inches and smaller, over 18 feet, 10 per cent net extra.

2¾ inches and larger, over 22 feet, 10 per cent net extra.

Merchant Steel.—The demand for merchant steel has in some lines been considerably in excess of the supply and premiums from $2 to $3 have been paid for anything like prompt delivery. Tool steel has been in active demand although no particular interest has been representd more heavily than usual. We continue to quote:

Cold rolled and ground shafting, 50 per cent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c to 1.80c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.05c to 2.10c. The price of planished and machine straightened tire is 1.70c base half extras as below. Iron finished tire up to 1½ inch by ½ inch, 1.65c base half extra tire list. Iron finished tire 1½ inch by ½ inch and over to be sold on regular bar basis of 1.50c base, half extra steel card.

Wire and Wire Nails.—The activity in wire products continues to tax the capacity of mills and since the first of the year the business has assumed almost boom conditions regarding tonnage output although there has been no change in price since the advance which went into effect Jan. 8. The leading interest and independents have alike been enjoying the prosperity and there has been no necessity to make price inducements in order to secure Jones & Laughlin Steel Co. having

the business, it being more aptly a situation of ability to supply demands. We continue to quote:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90, and less than carloads, $2; painted barb wire, $2 for jobbers in carloads; retailers in carloads, $2.05, and less than carloads, $2.15, with 30c for galvanizing; plain wire $1.70 to jobbers and $1.75 by carload.

Rails and Track Material.—Within the past week the Pennsylvania lines have placed heavy contracts for rails for 1906 delivery. It is understood this company placed supplementary orders for 50,000 tons of standard sections, of which 10,000 went to the Carnegie Steel Co., 20,000 to the Pennsylvania Steel Co., 12,000 to the Cambria Steel Co., and 8,000 to Lackawanna Steel Co. The Carnegie company booked orders for 15,000 tons for other interests. The demand for light sections is still strong and we continue to quote prices, unchanged, as follows: Fifty pounds and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 16 pounds, $30; 20 pounds, $28.50 to $29; 25 to 45 pounds, $28; angle bars for standard sections, 1.50c; spikes, $2.05 to $2.10.

Structural Material.—Within the past week several good contracts for structural material have been placed, the Jones & Laughlin Steel Co. having closed to furnish the fabricated structural material for the Union Trust Co., building, Pittsburg, and also the plain material for the Commonwealth Trust Co. building, Pittsburg. This material will be fabricated by the Fort Pitt Bridge Co. The American Bridge Co., secured the contract for the Commercial National Bank Building, Chicago. Bids for the new Field museum, Chicago are expected to be asked within a short time. This building will have the largest dome in the United States, being 165 feet in diameter. Producers of structural material are looking forward to a heavy building movement this spring and are getting into shape to handle it. Several of the big construction concerns are figuring on enlarging plants to increase capacity. We continue to quote:

Beams and channels, 15 inches and under, 1.70c; over 15 inches, 1.80c; zees, 1.70c, 1.75c; angles, from 3 to 8 inches, inclusive, 1.70c; universal and sheared plate, 6¼ inch and wider, 1.60c, base.

Billets.—With billets, as in bar iron, the inquiry within the past week has fallen off considerably, probably on account of consumers being well supplied. Bessemer billets, large size, are quoted strong at $27.50 and open-hearth at $28.50 strong with forging billets $33. Some producers are holding for $1 higher than quoted prices on bessemer and open-hearth billets.

Old Material.—There has been a tendency to softer prices in scrap during the week under review, but no sales of consequence enough to give sufficient grounds for change in quotations were made. The railroad embargoes on scrap that several consumers are still in effect. We quote:

Heavy melting stock, $16.75 to $17.25; old rails, long lengths $18 to $18.50; No. 1 cast scrap, $15.75 to $18; heavy melting scrap borings, $10.50 to $10.75; bundled sheet scrap, $15.50 to $17.75; No. 1 wrought scrap, $20; low phosphorus scrap, $22 to $23.

Coke.—For spot delivery from $2.35 to $2.50 can be done on furnace coke and from $3 to $3.25 on foundry coke. The extremely mild weather has had the effect of softening the coke market and there is not the slightest scarcity of supply or railroad transportation facilities. Should the present weather continue and the prevailing low coke prices be maintained, it is not unlikely that some of the large consumers who contracted ahead at $3.75 to $4 on foundry and $3 to $3.25 on furnace coke may ask to have ther contracts rewritten and extended, which proceeding, on former occasions, has been done under similar circumstances. For the week ending Jan. 13 the estimated production of the two Connellsville regions aggregated nearly 400,000 tons. In the Connellsville region proper the ovens made 283,003 tons and the lower Connellsville region 95,205 tons, the highest ever recorded

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Plant to be Enlarged.—The Chester B. Albree Iron Works, with a plant at Allegheny, Pa., has been incorporated under the laws of Pennsylvania, as the Chester B. Albree Iron Works Co., with a capital stock of $200,000. The directors are C. F. Holdship, H. H. King, Reuben Miller, Frederick G. Ely and Frank T. McClintock. The plant is to be enlarged and the manufcture of light rails, light structural work and iron forgings will be increased. Chester B. Albree is president and Ralph Albree secretary-treasurer.

The second annual meeting of the Lincoln Coal & Coke Co., was held at Scottdale, Pa., last week and the old board of directors reelected. They are: A. I. Keister, president; A. C. Overholt, vice president; E. L. Stoner, secretary; B. F. Keister, treasurer; and these with C. H. Loucks, directors. Eighty-one new ovens were built during the year, giving the company a 400 oven plant.

CHICAGO.

Mild Weather Causes Heavy Demand for Some Finished Products.

Office of *The Iron Trade Review*,
1164 Monadnock Block, January 23

Agricultural shapes and materials are most pronounced in their activity. Efforts to get early deliveries or place supplementary tonnages daily become more insistent. The mild weather that has prevailed this winter is largely responsible for this unusual demand. During its continuance, miles of fencing have been improved and the spring implement trade set in with a boom. Stocks of raw materials in consumers' hands were rapidly depleted, and since then there has followed an unending stream of requests for heavier and more frequent shipments. Building operations have also been greatly favored by the same cause and the demand for structural steel is heavy in consequence. At least 30,000 tons of shapes will be required this spring for the structures under contract or consideration. Specifications for rails and track supplies are very heavy. A contract for 10,000 tons of standard sections closed by the local mill several days ago was transferred to the Carnegie Steel Co. last week, which makes the total tonnage turned over to this company by the South Chicago mill considerably over 100,000. Plate specifications are light, though mills have their output sold for the next six months. Effective January 16, the price of plates for delivery on the Pacific coast was raised $2 a ton, the quotation now being 1.60c Pittsburg, or 2.35c San Francisco. Structural shapes for this shipment are unchanged. Contracts for nearly 10,000 tons of cast iron pipe were closed last week, the bulk of which was taken by the leading interest. Trading in boiler tubes is active, the week's tonnage having been greatly augmented by the large purchases of local jobbers. Improvement is noticed in southern pig iron, the sagging of a week ago having given way to an increased demand and strengthening of prices. Bar iron remains soft in sympathy with the weakness of the scrap market and prices have declined to 1.80c Chicago. Even this price might be shaded on a desirable order.

Pig Iron.—Since the announcement of the transactions in pig iron by the corporation and other large consumers, the tone of the local market has improved. A week ago southern iron was slowly losing ground, but under the stimulus of these purchases, it has regained partially its old buoyancy. There is not now the disposition to hedge on prices to the extent that was evident a week ago, and the market is gaining

more strength every day. Inquiry is broadening and increasing in tonnage, and orders are easier to close than before. While $14.50 Birmingham is the nominal quotation for southern No. 2 foundry, it is still possible to shade this price 25 cents a ton with some furnaces where a decent sized tonnage is the consideration. Transactions last week were more voluminous than at any time since the middle of December, and included one lot of 3,000 tons and several sales varying from 500 to 1,000 tons, practically all of it involving southern iron. Northern furnaces have not abated one iota of their strength. Very little iron is to be had from local stacks for first half delivery, and one producer is now selling for the last half. Foundry grades for this delivery are quoted on the same basis as that at which they have been offered for some time past, namely, $19.25 to $19.50 Chicago for No. 2. Because of the scarcity of malleable iron, 25 cents a ton higher than these prices is easily obtained, the minimum quotation being $19.50 Chicago. The increasing demand for small lots of iron emphasizes the growing seriousness of the shortage of cars in the south. The accumulation of stock on furnace yards is now very large, and the situation is liable to be further complicated by the sleet and snow of the last two days. Most of this iron is long past due, and its nondelivery has caused some embarrassment to western melters. Our quotations are as follows:

Lake Superior charcoal	$20.50 to 21.00
Northern Foundry No. 1	19.75 to 20.00
Northern Foundry No. 2	19.25 to 19.50
Northern Foundry No. 3	18.75 to 19.00
Northern Scotch Foundry	20.00 to 20.50
Ohio Strong Softeners No. 1	20.30 to 20.80
Ohio Strong Softeners No. 2	19.80 to 20.30
Southern Foundry No. 1	18.40 to 18.65
Southern Foundry No. 2	17.90 to 18.15
Southern Foundry No. 3	17.40 to 18.15
Southern Foundry No. 4	17.15 to 17.40
Southern No. 1 Soft	18.40 to 18.65
Southern No. 2 Soft	17.90 to 18.15
Southern Gray Forge	16.40 to 16.65
Southern Mottled	16.15 to 16.40
Southern Silveries (4 percent to 6 percent Silicon)	19.15 to 19.65
Jackson Co. Silveries, 6 percent	22.30
8 to 10 percent Silicon	23.30 to 24.30
Alabama and Georgia Car Wheel	22.65 to 23.15
Malleable Bessemer	19.50 to 20.00
Basic Iron	18.65 to 18.90

Billets and Wire Rods.—The withdrawal of the American Steel and Wire Co. from the market on wire rods has stiffened the price of this product. The last quotation made was $36 Chicago for Bessemer, and $37 for basic, but it is now impossible to get early deliveries at these prices. Demand for forging billets continues brisk, and prices are firm at $35 to $36, Chicago, according to the tonnage and delivery.

Iron and Steel Bars:—The growing weakness of the scrap market has made itself felt in the cost of the finished product. Bar iron has declined another 50 cents a ton, and is now quoted by local mills at 1.80c, Chicago. Some interests, it is stated, are willing to shade this price on desirable tonnage, but so far it cannot be learned as having been done. There is an abundance of specifications, although new business is slow in coming forward. Steel bars are strong and the movement from mills and warehouses very active. Interest centers largely in the tremendous volume of specifications that are daily received, evidencing low stocks in the hands of consumers. We quote carload lots, mill shipments, Chicago delivery, as follows: Soft steel bars and bands, 1.66½c half extras; soft steel angles less than 3 x 3, 1.76½c; hoops, 2.01½c; base, full extras; hard steel angles, 1.70c to 1.80c. Jobbers' prices are as follows: Bar iron, 2c full extras; soft steel rounds and squares, 2 inches and larger, $2 per 100 pounds base; flats, 2 inches and 4 inches by 1⅛-inch and thicker, $2 per 100 pounds base; flats, 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half ovals and half rounds, $2 per 100 pounds base; steel bands, 1.95c to 2c half extras; soft steel hoops, 2.30c to 2.40c full extras. Other sizes not mentioned above, $1.85 per 100 pounds base, plus half extras.

Sheets.—As judged by the strong demand for sheets there can be no doubt that the manufacturing lines in which this product is largely consumed are in an extremely healthy condition. It was expected that a lull would follow the advent of the last advance, but it has not yet put in an appearance. New tonnage continues to come in very freely and specifications are voluminous enough to keep mills operating to their fullest capacity for the next three months. Prices are very strong, the new schedule being firmly maintained. We quote carload lots, black sheets, blue annealed:

Nos. 8, 9 and 10, 1.86½c; Nos. 11 and 12, 1.91½c; Nos. 13 and 14, 1.96½c; Nos. 15 and 16, 2.06½c. Box annealed, Nos. 18-20, 2.26½c to 2.31½c; Nos. 22-24, 2.36½c; No. 26, 2.41½c; No. 27, 2.46½c; No. 28, 2.56½c; No. 29, 2.71½c; No. 30, 2.81½c. Jobbers' prices are as follows: No. 10, 2.10c to 2.15c; No. 12, 2.15c to 2.20c; No. 14, 2.20c to 2.25c; No. 16, 2.30c to 2.35c; Nos. 18 and 20, 2.50c to 2.55c; Nos. 22 and 24, 2.55c to 2.60c; No. 26, 2.60c to 2.65c; No. 27, 2.65c to 2.70c; No. 28, 2.70c to 2.75c; No. 30, 3.25c to 3.35c.

Quotations on galvanized shipments, carload lots, mill shipments, are as follows: No. 10-11, 2.51½c; Nos. 17-21 2.86½c; Nos. 22-24, 3.01½c; Nos. 25-26, 3.21½c; No. 27, 3.41½c; No. 28, 3.61½c; No. 29, 3.86½c; No. 30, 4.11½c. From store, galvanized sheets are quoted as follows: Nos. 10, 12 and 14, 3.10c to 3.20c; Nos. 16, 18 and 20, 3c to 3.10c; Nos. 22 and 24, 3.15c to 3.25c; No. 26, 3.35c to 3.45c; No. 27, 3.55c to 3.65c; No. 28, 3.75c to 3.85c.

Plates.—The consumption of plates is not in the same proportion as other products. The demand from ship builders is very active, but other lines of manufacture are slow in taking their contract quotas. All the mills have large tonnages on their books—in some cases the output is sold for the next six months—but specifications are not following to the satisfaction of producers. This is evidenced by the fact that deliveries on new business can be given within one month. The cause is attributed to the large productive capacity of the country, which is considered in excess of present consumptive requirements. Prices, however, are very strong, and official schedules are uniformly maintained. We quote mill shipments, Chicago delivery, as follows:

Tank steel, ¼ inch and heavier, up to 100 in. wide, 1.76½c base; flange steel, 1.86½c base; marine steel, 196½c base; all full extras. Plates 3-16 inch thick, $2 extra; gauges, 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store prices are very firm. We quote from local stocks: tank steel, ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; 72 inches to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 3-16 inch to 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.25c; flange steel, 25c extra; heads, 25c extra.

Structural Steel.—There is in temporary abeyance a large tonnage of structural steel for building work in this city. The new Field Museum will require upwards of 12,000 tons; the Cook County building, about 8,000 tons Two new office buildings, the Fisher and Pike, for which contracts have been let, between 800 and 1,000 tons each. In addition to these, there are several other buildings, planned or projected, which have been mentioned before, whose total requirements of structural shapes will aggregate 10,000 tons. Specifications on mills are very heavy, though new tonnage varies little from week to week. We quote mill shipments, f. o. b. Chicago, as follows: Beams and channels, 3 to 15 inches, inclusive, 1.86½c; angles, 3 to 6 inches, 1.86½c; angles, larger than 6 inches, on one or both legs, 1.96½c; beams, larger than 15 inches, 1.96½c; zees, 3 inches and over, 1.86½c; tees, 3 inches and over, 1.91½c, with the usual extras for cutting to exact lengths, punching, coping, bending, or other shop work. Quotations on lots from store are as follows: All angles, 3 inches and larger, $2.25 per 100 pounds base; tees, 3 inches and larger, $2.30 per 100 pounds base; 3, 5, 9, 12 and 15-inch beams,

$2.25 per 100 pounds base; 4, 8 and 10-inch beams, $2.50 per 100 pounds base; 6 7, 18, 20, and 24-inch beams, $2.75 per 100 pounds base; 3, 4, 9, 12 and 15-inch channels, $2.25 per 100 pounds base; 6, 7, 8 and 10-inch channels, $2.50 per 100 pounds base; 5-inch channels, $2.75 per 100 pounds base.

Rails and Track Supplies.—The only transaction in the week under review in standard sections was for 10,000 tons This was taken by the local company, but in compliance with its custom when its output is sold, the order will ultimately be transferred to the Carnegie Steel Co. Of its 1906 contracts, the Illinois Steel Co. has in the last two months transferred to the other mills of the Corporation considerably over 100,000 tons. In light rails, its capacity is taken for the next four months. New tonnage is very brisk and prices are firmly maintained. The demand for track supplies is without diminution, especially for spikes and track bolts, for which varying premiums are obtained. We quote as follows, all prices f. o. b. mill:

Heavy sections, $28; light rails, 12-pound sections $31; 16-pound, $30; 20-pound, $29; 25-pound, $28; 30 pounds and heavier, $27 to $28. Track supplies, angle bars, 1.50c to 1.75c; spikes, 2.10c; track bolts, 3½ x ¾, with square nuts, $2.55 to $3.00 per 100 pounds; with hexagon nuts, $2.70 to $3.15.

Merchant Steel.—Demand continues of excessive proportions, mills being unable to keep pace with the specifications. New business is confined to small supplementary lots reluctantly accepted from insistent customers. Prices are without change, mill shipments, f. o. b. Chicago, being quoted as follows:

Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c to 2.40c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c base; plow steel, 2.20c and upward, according to quality; toe calk steel, 2.21c; railways spring, 1.86½c. Cold rolled shafting 65 and 2½ per cent off to dealers, 50 per cent off in carload lots and 45 per cent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and up.

Cast Iron Pipe.—The mild weather which has prevailed to date in the west has stimulated a demand for cast iron pipe earlier than usual. During the week under review St. Louis, Mo. awarded a contract to the leading maker for 6,500 tons; Minneapolis closed with J. B. Clow & Sons for 1,500 tons, and Bismarck, N. D., for about 800 tons. The latter will be furnished by the United States Cast Iron Pipe & Foundry Co. Prices are without change, as follows: 4-inch water pipe, $31; 6, 8, 10 and 12-inch, $30; larger sizes, $29.50; gas pipe, $1 extra.

Merchant Pipe.—No change is observed from the conditions reported a week ago with reference to steel pipe.

Quotations on iron pipe have been withdrawn because of the tightly sold-up condition of the leading makers. Specifications are plentiful and prices strong. We quote carload lots, f. o. b. Chicago; ¾ to 6-inch black steel pipe, 78.35 per cent discount from list, and galvanized, 68.35 per cent. From stock jobbers are quoting 76½c to 77 per cent discount on the base sizes ¾ to 6 inch black steel pipe.

Boiler Tubes.—Active buying of tubes by large western interests characterized the week under review, the aggregate tonnage of which is very large. Prices are firm but without change. We quote as follows:

	Steel	Iron	Seamless
1 to 1¼ inches	40.35	37.35	53.00
1¼ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	
Up to 4¼ inches			50.50
6 to 13 inches	52.35	37.35	

Less than carload lots, from store, as follows:

	Steel	Iron	Seamless Steel
1 to 1¼ inches inclusive	40	35	42½
1¾ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	36
2¾ to 5 inches, inclusive	60	47½	42½

Wire Products.—There is an excellent demand for all forms of wire products. The consumption has been heavier than usual at this time of the year because of the open weather experienced this winter. Stocks are low everywhere, and jobbers and dealers are pressing mills hard for deliveries. It is not expected that this unusual consumption will materially affect the spring sales, and producers look for a continuance of present conditions for at least another six months. Prices are firm, carload lots to jobbers, Chicago delivery, being quoted as follows:

Wire nails, $2; painted barbed wire, $2.15; galvanized barb wire, $2.45; smooth annealed wire, $1.85; smooth galvanized wire, $2.15; polished staples, $2.15; galvanized staples, $2.40. Carload lots to retailers, 5 cents higher than above prices; less than carload lots, 15 cents higher.

Coke.—No change is noted in the coke market. Deliveries on local tracks are free and ample for the needs of this community. Prices do not strengthen, and Connellsville 72-hour grades are still offered at $3.50 ovens, or $6.15 Chicago. Contracts for Solvay by-product coke are also closed on this basis.

Old Material.—The local market continues to wane in strength. Dealers are heavily stocked with material, and are offering concessions to move it. The scarcity of frost and snow this winter has upset all the calculation of speculators in scrap, and it will take a long period of heavy weather to improve the local market. The only new list out this week is that of the C. B. & Q. which is offering about 4,000 tons for sale. We have advanced our price on steel axles $1 a ton, this product not sharing in the softness of other materials because of the extreme scarcity of billets. Quotations on gross tons are given in the first paragraph, as follows:

Old Steel Rails (4 feet and over)	$17.25 to 17.75
Old Steel Rails (less than 4 feet)	16.00 to 16.50
Old Car Wheels	19.00 to 19.50
Old Iron Rails	23.00 to 23.50
Relaying Rails subject to inspection	26.50 to 27.00
Heavy Melting Steel	15.00 to 15.50
Mixed Country Steel	12.50 to 13.00

For net tons we quote as follows:

No. 1 R. R. Wrought	$17.25 to 17.75
No. 2 R. R. Wrought	16.75 to 17.25
Shafting	18.00 to 18.50
Dealers' Forge No. 1	14.00 to 14.50
Wrought Pipe and Flues	12.00 to 12.50
No. 1 Cast, 150 pounds and less	14.50 to 15.00
No 1 Mill	9.00 to 9.50
No. 1 Busheling	12.50 to 13.00
No. 2 Busheling	12.00 to 12.50
Country Sheet	8.50 to 9.00
No. 1 Boilers Cut	12.50 to 13.00
Boiler Punchings	15.00 to 15.50
Iron Car Axles	24.00 to 24.50
Steel Car Axles	21.00 to 22.00
Iron Axle Turnings	12.25 to 12.75
Cast Borings	10.00 to 10.50
Mixed Borings, etc	10.00 to 10.50
Machine Shop Turnings	12.25 to 12.75
Railroad Malleable	15.00 to 15.50
Agricultural Malleable	14.00 to 14.50
Stove Plate and Light Cast Scrap	12.00 to 12.50
Old Iron Splice Bars	20.00 to 20.50

CINCINNATI.

Very Little Buying of Pig and Prices Are Somewhat Softer.

January 23, 1906.

Pig Iron.—The trading has been quite moderate in volume the past week and there is not much inquiry pending. No large sales have been reported. A 500-ton order was booked for first quarter delivery on the basis of $14.00 Birmingham for No. 2 foundry to a manufacturer in southern Ohio and some Ohio iron sold to another manufacturer in the same locality on the basis of $17.50 for No. 2 foundry at southern Ohio furnace. This sale covered about 400 tons of first quarter delivery. About 300 tons of southern iorn was sold to the same purchaser on the basis of $14.00 Birmingham. There is a 2,000 ton inquiry for foundry iron from Pittsburg territory in the market. This covers practically all of the important transactions. The general run of small orders has been moderate. Gray forge is freely offered and there is but very little inquiry for this grade and it is believed that $12.50 Birmingham can be done on southern gray forge. The

quietude and lack of interest on the part of buyers is creating the belief in some quarters that consumers are fairly well covered with contracts for the first half of the year and there is practically no inquiry for second quarter business. Trade sentiment is more in buyers' favor than has been noticeable recently, although furnace interests are just as firmly maintaining $14.00 Birmingham as a minimum as they have been for the past several weeks. The larger producers in the Birmingham district decline to entertain firm offers at any price below $14.50 Birmingham. The extent to which buyers are covered for the next five months, is a matter of individual opinion in the trade. There are those who believe that a large proportion have bought, while others maintain that since the price reached its present level, general buying has not been large, and consumers have not covered beyond the first quarter to any appreciable extent. Lack of inquiry at this time for second quarter requirements may, therefore, be due either to the belief that prices have reached full figures, and that nothing could be gained by placing orders now, with the possibility of slightly lower figures by the end of the first quarter, or consumers may have provided for their wants. Under the first proposition the market looks strong, but if the second reason be valid, and result in a protracted dullness this would be calculated to bring about easier quotations. We quote f. o. b. Cincinnati:

Southern Foundry No. 1	$17.25 to 17.75
Southern Foundry No. 2	16.75 to 17.25
Southern Foundry No. 3	16.25 to 16.75
Southern Foundry No. 4	15.75 to 16.25
Southern Foundry No. 1, soft	17.25 to 17.75
Southern Foundry No. 2, soft	16.75 to 17.25
Gray Forge	15.75 to 16.00
Northern Foundry No. 1	19.15 to 19.65
Northern Foundry No. 2	18.65 to 19.15
Northern Foundry No. 3	18.15 to 18.65
Jackson County Silvery, 8 per cent	20.15 to 20.65
Southern Charcoal	19.75 to 20.25

Finished Material.—The market is firm and jobbers report a good demand all along the line with a recent advance in bar iron well maintained. Bar iron is quoted at 1.85c to 1.90c and the recent advance in sheets is well sustained. We quote: steel bars at 1.63c, half extras with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets No. 10 and No. 12, in car lots are 2.58c. We quote black sheets, No. 27 at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.85c; No. 27, 2.75c; No. 16, 2.35c; No. 14, 2.25c; No. 12, 2.15c. Tank plates are firm and sell out of store at 2.10c for ¼-inch and 2.10c for 3-16, Nos. 8 and 10. Beams and channels are quoted at 2.35c to 2.60c from stock and angles at 2.10c to 2.15c for base sizes.

In merchant pipe the market holds quiet but firm with quotations for wrought iron pipe only obtainable upon application with specifications. We quote f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing Discounts)

	Steel Pipe		Guaranteed Wrought Iron Pipe	
	Black Per cent	Galv. Per cent	Black Per cent	Galv. Per cent
⅛ and ¼ inches	69.7	52.7	....	....
⅜ inch	73.5	61.3	....	....
½ inch	73.7	61.7	....	....
¾ to 6 inches	77.7	67.7	....	....
7 to 12 inches	72.7	57.7	....	....

Coke.—The demand is light and the market dull and showing weakness. In nearly all of the coke producing districts $3.00 for foundry coke can be done and in some cases slightly shaded for prompt shipment coke. There is practically nothing doing in contracts. The car supply for the past few weeks has been better. Quotations at the leading coke producing districts are as follows:

†Wise County, Va. Furnace Coke prompt shipment	$2.75 to 3.00 per ton
Wise County, Va. Foundry Coke prompt shipment	3.00 to 3.25 per ton
Pocahontas Furnace Coke on contracts	2.50 to 2.75 per ton
Pocahontas Foundry Coke on contracts	2.75 to 3.00 per ton
Connellsville Furnace Coke prompt shipment	2.50 to 2.75 per ton
Connellsville Foundry Coke prompt shipment	3.00 to 3.25 per ton
New River Foundry Coke on contracts or prompt shipment	3.00 to 3.25 per ton
New River Furnace Coke, prompt shipment	2.50 to 2.75 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.65 per ton on $9.00 pig iron, plus 17 per cent of the advance on pig iron above $9.00 Birming ham

Old Material.—Prices are unchanged, but it is intimated in some quarters that dealers are inclined to offer with slightly more freedom. We quote f. o. b. Cincinnati:

Old No. 1 railroad wrought, net tons	$17.50 to 18.00
Cast machine and foundry, net tons	14.00 to 14.50
Old iron rails, gross tons	24.00 to 25.00
Old steel rails, gross tons	16.50 to 17.00
Old short lengths, gross tons	17.50 to 18.00
Old iron axles, net tons	23.50 to 24.00
Stove plate, net tons	10.50 to 11.00
Wrought turnings, net tons	11.00 to 12.00
Cast borings, net tons	9.00 to 9.50
Car wheels, net tons	16.50 to 17.00

NEW YORK.

Fair Run of Business in all Grades of Pig Iron—Great Demand for Shapes.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST. January 23.

Pig Iron.—There has been a fair amount of buying in all grades of pig iron during the week and no material change in conditions. The weather has favored the consumer and the half-expected famine has not arrived. Inquiries have become somewhat more active, and the movement of metal has been entirely satisfactory. Inquiries in the market to-day aggregate fully 90,000 tons including from 25,000 to 30,000 tons of basic. A fair proportion of the latter is already practically provided for and the remainder will probably be placed within a few days. A large inquiry for foundry for the second half is still to be met. Manufacturers of railroad equipment are asking for bids on some 8,000 tons, and stove makers require several thousand tons. Inquiries for malleable and standard Bessemer foot up to between 15,000 and 20,000 tons. Pipe founders are somewhat less in evidence, but are apparently ready to snap up any stray lots. Few of the sales in foundry and mill grades were individually large. One of the most considerable involved 2,000 tons of No. 2. Most of the purchases were in lots ranging from 500 tons down. There was a sale of 550 tons of Virginia No. 2, another of 500 tons of Pennsylvania No. 2, and a third of 500 tons of high silicon iron. Quotations for the third quarter are beginning to make their appearance. In iron pipe there is still a large amount of business pending both on municipal contracts and for independent gas and water lines. The makers are inclined to advance prices. Ferro-manganese continues in strong demand with shipments up to July bringing from $125 to $135 per ton. Quotations for the last quarter of the year are from $100 to $125 per ton.

The following are prices at tidewater:

Northern No. 1 Foundry	$19.00 to 19.50
No. 2 Foundry	18.00 to 18.75
No. 2 Plain	18.00 to 18.25
No. 1 Southern Foundry	18.75
No. 2 Southern Foundry	18.25
No. 3 Southern Foundry	17.25 to 18.00
No. 4 Foundry	17.00 to 17.25

Pig Iron Certificates.—Certificates have been easy but trading in warrants has been more brisk. The general tone of the market seems to be improving although prices are a shade lower. In warrants there was a sale of 500 tons Alabama No. 2 foundry at $13.75, and in regular one of 100 tons January at $16.75 and one of similar amount for February delivery at $16.85. A lot of 100 tons for April delivery brought $16.95.

Foundry iron warrants follow:

	Bid.	Asked.
January	16.60	17.25
February	16.90	17.15
March	16.60	17.25
April	16.60	17.25

Finished Iron and Steel.—In the steel market the heavier products again occupy the center of the stage. After the enormous sales of the past few months the present business in structural shapes and rails is suprisingly active. Contracts for between 10,000 and 20,000 tons of structural steel have been placed during the week and the amount in prospect has increased greatly. The 50,000 tons actually in the market with the work in prospect make a total of well over a half million tons. There is a little reluctance in the building trades to place contracts owing to the

labor situation, but the retarding effect is inconsiderable. A large proportion of the tonnage in prospect is for industrial improvements; railroad work on bridges and terminals also adds a large total. The order for the 8,000 tons of steel required for the New York Central post office went to the McClintic-Marshall Construction Co., and the same company secured the contract for 1,500 tons of material for track elevation in Chicago. In New York City and its immediate vicinity there are a number of projects on foot which will require large tonnages of steel. The two McAdoo tunnel terminals will require several thousand tons, one business building will take 10,000 tons. A portion of the New York Central terminals still remains to be let, and various industrial plants in New Jersey including the Singer works at Bayonne will require a large amount of steel. The Grade Crossing Commission, of Brooklyn, is in the market for about 2,500 tons of bridge material. At a conference of the steel plate association held in Jersey City last week it was decided to raise the quotations of marine boiler plates $4 per ton to the basis of $40 per ton instead of $36 or $2.04½ per 100 pounds instead of $1.84½. Prices of tank plates and other forms remain unchanged. Locally this change in prices makes very little difference for premiums as high as $6 per ton have not been rare. The movement in light products has been only fair, tin plate being somewhat irregular. The following are the prices at tidewater: Angles, 3 to 6 inches x ¼ inch and heavier, 1.84c; beams, 3 to 15 inches, 1.84¼c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine boiler, 2.04½c; refined iron bars, 1.89½c to 1.99½c; soft steel bars, 1.64½c to 1.79c; sheets, No. 28 black, 2.40c.

Old Materials.—There has been little change during the week. Customers are apparently not anxious to buy at present prices and holders show no disposition to force material on the market. The demand from consumers is light and the available stock is in strong hands. About 700 tons of standard section old steel rails were reported sold during the week and about 1,000 tons of heavy steel scrap.

The following are prices approximately f. o. b. tidewater.

Old iron rails	$21.00 to 22.00
Old steel rails, long lengths	15.50 to 16.00
Old steel rails, short pieces	15.00 to 15.50
Relaying rails	23.00 to 24.00
Old car wheels	17.50 to 18.00
Old iron car axles	24.00 to 25.00
Old steel car axles	19.00 to 19.50
Heavy melting steel scrap	16.00 to 16.50
No. 1 railroad wrought scrap	20.00 to 21.00
Iron track scrap	18.00 to 19.00
Wrought pipe	14.00 to 15.00
Cast borings	10.00 to 10.25
Wrought turnings	14.50 to 15.50

CLEVELAND.

Lower Quotations on Pig and Decreased Sales—Coke Also Declines.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, January 24.

Pig Iron.—The pronounced activity of the fall and early winter in the local pig market has apparently spent itself and the situation has eased to a considerable extent during the past week. The brisk buying which marked the first half of January has grown lighter and current business has resolved itself into the filling of a goodly number of inquiries for small tonnages for immediate or early delivery. Prices, which a fortnight ago displayed a decided upward tendency, have become far less firm in tone and it is reported that quotations which have held for several weeks past are being shaded. What the market of the immediate future will be depends largely upon how well consumers have covered their requirements for the first half. The opinion generally prevails that their needs are well cared for through the first quarter, but that at the present rate of consumption considerable buying will be necessary for the second quarter. Consumers, however, are not alarmed at this prospect, as they feel that the output for the winter will prove adequate for all needs and that while prices will certainly not advance for this period, there is an added incentive toward delaying their purchases in the probability of a slight decline. The week has developed a fair number of inquiries for small tonnages, most of which have been turned into sales, but the aggregate is not large. One inquiry of good proportions is noted. It is reported that some iron has been sold as low as $17, Cleveland, for spot shipment, and that $17.50 valley has been shaded for No. 2 foundry grades. Basic continues firm on the basis of $17.50 valley furnace, and southern grades are on the basis of $14.50, Birmingham, though lower figures are obtainable at least on small, scattered lots. Coke has weakened to a remarkable extent. The absence of winter weather to tie up transportation facilities and the blowing out of a number of furnaces, thus releasing good-sized tonnages which had been contracted for, have thrown a considerable quantity of spot coke on the market and sales as low as $2.20 for furnace grades are reported. Contract furnace coke is about $2.50. Foundry grades are practically unchanged. We quote, Cleveland delivery, as follows:—

Bessemer	$18.10 to 18.35
No. 1 Foundry	18.00 to 18.50
No. 2 Foundry	17.50 to 18.00
No. 3 Foundry	17.00 to 17.50
No. 2 Southern	17.85 to 18.35
Gray Forge	16.35 to 16.85
Gray Forge, Southern	15.85 to 16.35
Lake Superior charcoal	19.50 to 20.00

Finished Materials.—In certain lines the easier tone assumed by pig iron has made itself felt and better deliveries are procurable. Bar iron is slightly weaker, though the leading interest is still quoting 2c Youngstown. Car manufacturers appear to be well covered and other consumers are largely substituting the steel bar, which continues in brisk demand with prices firm at the level which has prevailed for some time. Specifications are generally lighter in structural shapes, a feature to be expected at this of year. Good deliveries are reported in rails for both light and standard sections. Sheets have become decidedly the strongest factor of the present market; they are in excellent demand and the new schedule of prices is well maintained. In fact, even in those lines in which the situation has eased most noticeably there is no disposition to quibble over prices and business at current quotations is ample to keep the mills running to capacity. The only effect of the relaxation of the tense conditions which have prevailed for some time will be to make improved deliveries possible. Bookings on hand will tax the capacity of the producers for the entire first half. Tool steel is much sought, with January business proving the heaviest in history. The demand in this line is general, with soft steel and boiler plate especially strong.

Old Material.—Practically no business is being done in old materials, what little trading there is being chiefly small tonnages at forced sales. The situation, however, is decidedly weaker, all lines of scrap sharing equally. Dealers have placed their hopes in a stretch of severe weather, while consumers have played the waiting game with the aim of forcing prices down from the high level to which they climbed during the fall months. However, so little scrap is changing hands that it is difficult to establish exact quotations. We have revised our table of prices in several lines to conform with the present tendency, rather than in accordance with figures established definitely by trading, and now quote f. o. b. Cleveland, as follows:

Old Iron rails	$21.00 to 25.00
Old steel rails (over 6 feet)	16.75 to 17.75
Old steel rails (under 6 feet)	17.00 to 18.00
Old car wheels	17.50 to 18.00
Steel boiler plate	14.00 to 15.00
Steel axles	21.00 to 22.00
Malleable iron (railroad)	16.50 to 17.50
Malleable iron (agricultural)	15.50 to 16.50
Heavy steel	16.50 to 17.00

We quote as follows, net tons:

No. 1 R. R. wrought	17.50 to 18.00
No. 1 busheling	14.50 to 15.00
No. 1 machine cast	13.75 to 14.25
Iron axles	23.00 to 24.00
Axle turnings	11.50 to 12.50
Wrought turnings (free from cast)	11.00 to 12.00
Grate bars	9.50 to 10.00
Pipes and flues	13.50 to 14.50
Tank iron	11.00 to 11.50
Hoop and band iron	8.00 to 9.00
Sheet iron	7.00 to 8.00
Wrought drillings	11.00 to 12.00
Stove plate	10.50 to 11.00
Cast borings	8.50 to 9.50

PHILADELPHIA.

Prices of Pig Iron Firm and Demand Strong—Scrap is Dull.

January, 23.

Pig Iron.—Reports from Chicago and other western centers of an apparent weakening in the pig iron situation find no confirmation in this market. Prices, though as a rule not quotably higher, grow steadily firmer. This is shown by one of the largest pig iron producers in the east, whose irons have long been regarded as standards, who last week made $18.75 their price for No. 2 X foundry, with other grades in proportion. This figure has for some time been the outside range, but may soon be expected to become the general minimum. One of the few producers of low phosphorus reports that he could easily get $28 for spot delivery, but his capacity is already sold months ahead at $24.50 to $25.50. There is no disposition on the part of producers to take advantage of the necessities of customers, but the demand continues so large and so urgent that prices naturally tend upwards. With the present remarkable capacity for production, this advance is not expected to go far, but the enormous consumption is almost certain to prevent any concessions during the first half of the year. Orders are now being taken for the third quarter, and these show weakening on the part of the furnace men. There is less activity in basic iron, which is practically all sold up months ahead, but there is no let up in the demand for foundry irons. Prices continue unchanged from last week, with the outer range more frequently paid than before, as follows:

No 1X Foundry	$19.00 to 19.50
No. 2X Foundry	18.50 to 18.75
No. 2 Plain	18.00 to 18.25
Standard Gray Forge	17.00 to 17.50
Basic	18.00 to 18.25
Low Phosphorus	24.50 to 25.50
Southern No. 2X, rail	18.75 to 19.00

Finished Material.—It is now reported that no changes will be made in present schedule prices during the coming year, any advances taking the form of premiums. This is due to a certain clearing up in the situation due to the completion of new mills and the fact that the strikes of the structural iron workers has enabled the mills to catch up with some of the business. The summer like winter has also proved an unexpectedly favorable factor. The prices quoted last week continue unchanged: Beams, channels and angles according to specifications 1.82½c to 2.50c; refined iron bars, 1.75c to 1.85c; steel bars, 1.63½c to 1.83c; plates, 1.73½c to 1.83½c.

Old Material.—The softness in scrap continues, and a number of price concessions have been made during the past week. This is due to the lack of orders from the mills, which seem to have accumulated large stocks for their use. Prices may be quoted as follows:

Old steel rails	$17.75 to 18.00
No. 1 steel scrap	17.00 to 17.50
Old steel axles	21.50 to 22.00
Old iron axles	27.00 to 28.00
Old iron rails	23.00 to 24.00
Old car wheels	17.50 to 18.00
Choice scrap, R. R. No. 1 wrought	21.00 to 22.00
No. 1 yard scrap	19.00 to 19.50
Machinery scrap	16.00 to 16.50
Low phosphorus scrap	23.00 to 24.00
Wrought iron pipe	16.00 to 16.50
No. 1 forge fire scrap	16.00 to 16.50
No. 2 forge fire scrap, ordinary	13.00 to 13.50
Wrought turnings	14.25 to 14.75
Axle turnings, heavy	15.50 to 16.00
Cast borings	10.50 to 11.00
Stove plates	13.00 to 13.50

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*, }
ROOM 1315, No. 150 NASSAU ST., January 23 }

Pig Tin.—The tin market has been very active during the week, sales having been very heavy, probably the largest of any week for a year. Today's close was steady. Today's quotations follow: Spot 36¼ to 36¾; January, 36⅛ to 36⅝; February, ; March, 36 to 36.40; London, £164 10s spot and future; arrivals for the month to date, 3,520; affoat, 3,110.

Copper.—The market is lower and weaker, the offering of surplus stock having had a depressing effect. Today's closings follow: Lake and electrolytic, 18 to 18¼; casting, 18 sellers; London's closing today: £68 5s and £66 5s. Exports for the month to date, 9,693 tons.

Lead.—The market for lead has suffered a sharp reaction with a close heavy and lower. Today's closings: 5.70 to 5.80; St. Louis 5.70; London, £16 12s 6d.

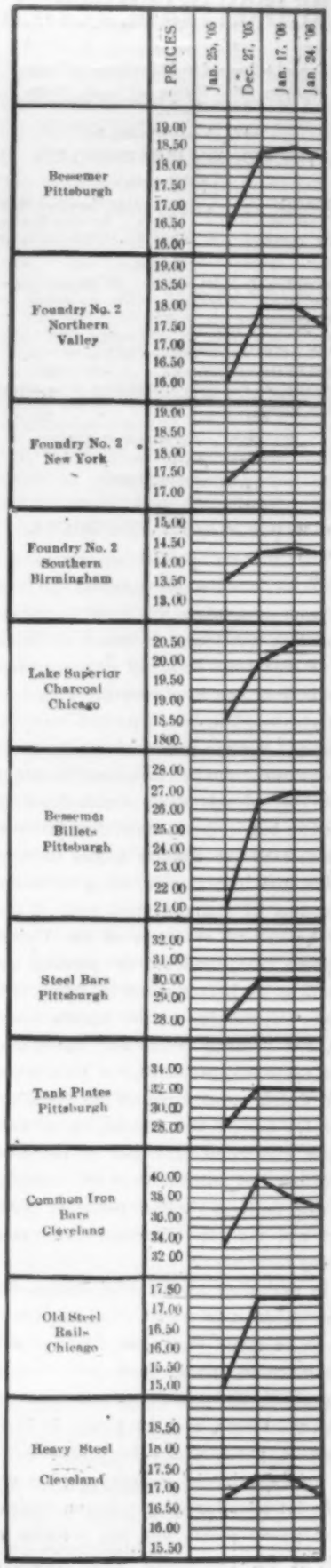
Spelter.—Refined spelter has been weak and lower. Today's closing, 6.40 to 6.50; St. Louis, 6.40; London, £28. Louis, 6.40; London, £28.

Antimony.—No material change has occurred. Cookson's and Hallett's 14½c to 15c and other grades, 13¾c to 14½c.

Decided to Merge.—On Friday, Jan. 1, at the annual meeting of the New York Metal Trades Association, the Administrative Council voted in favor of merging that Association into the National body.

The Connellsville (Pa.) Machine and Car Co., has let the contract for the building construction of its new plant to the Fayette Lumber Co., of Connellsville. The Van Dorn Iron Works, Cleveland, which has the structural iron work contract has notified the company that the material is ready for delivery. It is expected the company will be able to start the new plant April 1.

PRICE CHART.



THE IRON TRADE REVIEW

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USING WASTE PRODUCTS.

The present period of prosperity with its innumerable projects for expansion and plans for new construction is a good one in which to think of eliminating some of the wasteful methods which have heretofore characterized the American iron and steel industry. We are proud of our immense production, our tremendous tonnages and the princely sums accumulated as profits, but is it not time that the iron masters of the country began to consider the other side of production, economy of material?

The natural resources of the United States have rendered it possible to build up an industry and to amass fortunes unparalleled in the world's history. But deposits of ore and coking-coal are not inexhaustible, and a time is not far distant when increased profits will not involve merely the assembling of still more enormous quantities of fuel and ore, but the utilization of the material in the yards to the last pound of product and the last thermal unit now going to waste.

In designing among other things, the new plants now under consideration it is to be hoped that some attention will be given to the methods for utilizing more fully the waste products of smelting operations, and the power in blast furnace gases which have introduced a new era in the industry in Europe. The introduction of gas driven engines and power plants and the erection of works for converting waste products into useful materials have rendered it possible to realize a profit without further drafts upon existing stores of raw materials, and have also placed the iron and steel industry on a par with other scientifically conducted enterprises in which the whole profit is necessarily derived from products formerly considered useless.

A sentiment of pride, if considerations for the future have no effect, should impel the engineers of the country to make some effort to maintain their place in the front rank not only as regards tonnage and the economical handling of material but also in the matter of reduced waste. In 1906 they have an opportunity which is not likely to return within a generation at least. The world is waiting to see what they will do with it.

BROAD TRAINING FOR TRADES.

Full of significance and promise for the continuance of American industrial supremacy is the widespread consideration now being devoted to the apprenticeship system and the education of the coming workmen through the establishment of trade schools in greater numbers and on a more practical basis. To the recognized efficiency of the American workman of the past has been largely due the upbuilding of our manufacturing institutions. His ability has made itself felt to such an extent in the world-market that competing nations have not been slow to copy his methods. Germany has been notably successful in this regard, in great part through her numerous trade schools which are today one of the most powerful factors in her industrial advance.

Of late the American manufacturer has encountered constantly increasing difficulty in filling his shops and factories with capable, intelligent workmen; he has sought more and more specialized men only to discover that the facilities for training them have been far from keeping pace with the demand. The shop, long counted upon to provide the proper schooling for the apprentice, has become a place of extreme specialization and in the striving for output the foreman no longer has time to devote to the boy learning the trade, even if facilities were afforded. Where there is a disposition to look after the apprentices their numbers are usually kept down to the minimum through the efforts of the labor union which constantly tries to instill into them the idea of limited production. The shop will continue to do its part, but that it can not be depended upon to turn out skilled workmen as fast as increased production demands has been evident for some time. Attention has naturally been directed to the only apparent avenue of relief, the trade or technical school.

Although the plan is as yet in the experimental stage, several forms of the trade school are in operation, all with success in varying degree. Their installation has not been entirely welcomed. Considerable opposition has been manifested by the labor unions who see in their weakening grasp on the apprenticeship system and the increasing number of young men trained outside the limits of their influence the impossibility of their monopoly in the labor field. Their attitude is purely a selfish one, possessing little weight in determining the merits of the plan. Another element of criticism, coming chiefly from those outside the industrial world, is typically embodied in a recent address of Frank A. Vanderlip, well-known as a banker and financier, who states: "the forces of combination are united in a tendency to make of a great percentage of our population commercial and industrial automatons, without diversity of skill, without an understanding of principles and without a breadth of capacity." He condemns the trade school in that its aim is technical training solely, and makes a plea for the old fashioned "schoolmaster."

The criticism of Mr. Vanderlip is answered by the course of training outlined for practically every trade school now in operation or contemplated. Technical training is included, to be sure, in ample proportions and along diverse lines, but it is a thorough training, extending at least to the simpler scientific principles underlying the industry and requiring for its understanding a general school education of such degree as to insure the recipient a broad appreciation of life outside the walls of his factory. As an instance

may be cited the Winona school, where the National Founders' Association recently founded thirty scholarships. Its course is designed to afford the young men training in the "free use of the hand and the skill of molding," with such science as may prove useful in that direction; to this is added instruction in the ethics and duties of those in authority about a foundry and in accounts and the ethics of business. The further effort is made to throw about the school life influences which will fit the students for lives beneficial to society. Also noteworthy as typical of present tendencies is the plan of the Cincinnati Metal Trades Association to send its brightest young men to the University of Cincinnati and employ them in shops of association members on alternate days.

The founders and directors of trade schools are aware that they are on the wrong track if they aim to make of their graduates mere machines; they also know that efforts at increasing the number of workmen alone will be as certain of failure. They are endeavoring first of all to attract to their schools those young men whose natural inclination is in their line; they seek the youth of good physical ability and at least the common school foundations of an education. They aim to make their training include not only the ability to do a thing, but to understand why it is done. They endeavor to develop the youth for his own good, to discover his resources, foster them and make him a thinking, intelligent workman. This is the plan upon which the successful trade schools are being operated. Their influence can only be for the mutual benefit of workman and industry, and the more rapid their establishment the more rapidly will one of the chief industrial problems of today approach a satisfactory and permanent solution.

FIFTEEN YEARS' RECORD.

The tin plate industry of South Wales is rejoicing over an unusual degree of prosperity. At the end of November 427 tin mills were in operation, an increase of 4 during the month, and constituting fully 95 per cent of the total number of mills in operative condition. A record kept from the beginning of 1896 does not show any month with as many mills in operation. The exports of tin plates and black plates in 1905 were in the neighborhood of 425,000 gross tons, while the domestic consumption was not far from 200,000 tons, making a total production of approximately 625,000 gross tons. Unfortunately statistics of production are not kept, and it is only an estimate that this figure about corresponds with the highest production ever made.

The tin plate industry in the United States has just closed a year of by far the greatest production yet seen. The American mills have produced somewhere in the neighborhood of 600,000 gross tons, or one-fourth more than the best previous record.

These facts make up a picture which could not have been drawn by the most sanguine fifteen years ago, when the McKinley tariff law had been enacted, but had not become effective as to tin plate. The Welsh tin mills were rushing tin plate to this side to escape the impending increase in the duty, while their owners were openly berating the Americans for attempting the impossible and secretly fearing the most serious results should they succeed after all. A handful of men in the United States were timidly building little tin plate plants, most of them only dipperies, and the congressional sponsor for the tin plate duty had been badly defeated in the November election.

In all the argument that preceded and followed the establishment of tin plate making in the United States one fails to recall one word of assertion or well defined hope that there would be found room in the world for the old Welsh tin plate industry and the prospective American industry too. It was to be failure on the part of the Americans or a pampered existence, at the expense of Wales.

At the end of fifteen years we find the Welsh tin plate industry stronger than ever, with the poor mills weeded out and the remainder making tin plate more cheaply, relative to cost of raw materials, than ever before, and a total output equal to the best. In the United States we find an industry which has taught lessons to the Welsh makers and could teach more if they would be heeded, and which has an output substantially as great as that of Wales.

There is no use putting up a theory against a condition, and the McKinley tariff must therefore be given the credit for the establishment of the American tin plate industry. The industry was not established prior to its enactment, but events have shown that had capitalists been willing to assume the risk, the industry could have been built up with a continuance of the old cent a pound revenue tariff. The difference in market prices, f. o. b. Swansea and f. o. b. Pittsburg is now 55 cents per full weight box, or about half a cent a pound. Several independent mills in the United States are operating at a profit and paying fully $2.00 per ton more for tin plate bars than the Welsh mills have to pay. Pig tin is substantially the same price in both countries, and wages are much higher in the United States.

While outputs in 1905 were substantially equal in the two countries, there is a great disparity in the number of mills. The number of plants does not figure as each mill in a plant is virtually a unit. In Wales there are about 450 mills of which, as noted, 95 per cent were in operation at the close of November. In the United States there are about 340 regularly operative mills, which have been in operation at one time or another within the past year, the leading interest having 242 and independent interests almost 100. There are about 30 other mills, not regularly operative. It can be assumed that an average of not less than 400 mills was operated in Wales during 1905, while an average of scarcely more than 275 mills was operated in the United States. With substantially the same total production, it appears that the output per mill has been between a third and a half greater in the United States than in Wales.

Tin plate was not at first considered a "tonnage" proposition in the United States. Now it is, and a quite moderate profit per ton is regarded as not altogether unsatisfactory. Tin plate is much cheaper, relative to other iron and steel products, than it was, and it is largely this fact which has so stimulated consumption.

BUFFALO FOUNDRYMEN'S ASSOCIATION.

The annual meeting and election of officers of the Buffalo Foundrymen's Association, took place at its headquarters, 685-691 Ellicott Sq., Jan. 16. The following officers were elected for the ensuing year: President, Lyman F. Hubbell; vice president, Wm. H. Barr; treasurer, Geo. M. Trefts; secretary, John E. Gorss. Executive committee: Lyman P. Hubbell, Wm. H. Barr, T. L. Richmond, Edward Kener, Jr., and H. D. Miles.

The reports of the treasurer and secretary showed that the association is in a very prosperous condition, with a membership of 36 foundry firms and 4 applications to be acted upon at the next regular monthly meeting.

The attendance at the meetings during the year, has averaged 90 per cent. Twenty-two of the members are affiliated with the National Founders' Association. The members are especially interested in the employment department feature of the association. Many of the firms give employment only to those who are recommended by the bureau.

LATE PITTSBURG NEWS.

(Special Telegram.)

Pittsburg, Jan. 24.—No better prices can be obtained on northern No. 2 than $17.75 to $18.00 for first quarter, although much lower quotations prevail for the second quarter. The southern situation is weeker than in the north, $14.00 Birmingham quoted for No. 2.

The McClintick-Marshall Construction Co. has secured contracts for 7,500 tons of structural material for the new New York postoffice and 1,500 tons for track elevation work of the Pennsylvania lines at Chicago.

The S. Obermayer Co. has recently purchased the foundry supply factory of H. S. Vrooman of Chicago. The entire factory of this concern as well as their stock of merchandise has been moved to the Chicago plant of the S. Obermayer Co., which will fill all orders of this department.

The Dominion Brazing Co., Ltd., has been incorporated under the laws of Canada for brazing, casting and refining iron and other metals, with head office at Montreal and a capital of $100,000.

The pattern shop of the Pencoyd Iron Works near Philadelphia, operated by the American Bridge Co., was destroyed by fire on the night of Jan. 21, causing a loss estimated at from $150,000 to $200,000.

TRADE PUBLICATIONS.

W. E. Caldwell Co., Louisville, Ky., has brought out a catalog describing tanks and water towers, with special reference to fire protection in manufacturing plants. Price lists of different types of tanks and towers are given gether with descriptions of installations. The catalog comprises 38 pages and contains considerable useful information.

Merchant, Evans Co., Philadelphia, has recently issued a pamphlet, entitled "Roofing Rules." This is somewhat different from anything issued before, and discusses the various roofing materials in use, giving their properties, weights and comparative values. It then presents a number of rules for the proper construction of metal roofs. It is a particularly valuable paper for people interested in roofing.

The Niles-Bement Pond Co., New York city, is disseminating some information on foundations and setting of machine tools, by means of a small booklet. It takes up the different foundation materials, gives rules for excavating and for the placing of foundation bolts and washers, together with a table of the bearing value of various foundation material. The proper method of setting machine tools is also described.

The Interstate Engineering Co., of Bedford, Ohio, is distributing bulletin No. 7. This is an unusually handsome publication of 71 pages, showing briefly and principally by means of illustrations the various lines of manufacture in which the company is engaged. The machines illustrated consist of locomotive cranes, gantry cranes, bridge, jib, and pillar cranes, derricks, dredges, hoisting and conveying machinery and coaling stations.

The Lunkenheimer Co., Cincinnati, is distributing its 1906 catalog. This is a volume comprising 475, 5 x 7 inch pages, which describes and illustrates the full line of valves and fittings made by this company. In addition to those devoted to the listing of goods, a section of 50 pages added containing a large amount of useful information and tables on engineering subjects. The book is well printed, and is bound in cloth.

The R. K. LeBlond Machine Tool Co., Cincinnati, Ohio, has issued a publication entitled "The Modern Milling Machine." This describes milling machines in general and the LeBlond machine in particular. The different parts of the machine are described in detail, the factors entering into the design and construction being taken up and discussed. The book is plentifully illustrated with halftones and line drawings, and contains a number of tables relating to milling machines.

The Allis-Chalmers Co., Milwaukee, in Bulletin 1501, describes the Allis-Chalmers Reliance Corliss engine belted type. This engine is somewhat different from other types manufactured by this company. New designs have been adopted where experience has shown this to be necessary. The bulletin illustrates with half tones, various parts of the engine, all of which are completely described. Incorporated in the bulletin also is a table of sizes of engines varying from 28 to 700 horsepower.

The David Maydole Hammer Co., Norwich, New York, is distributing two publications; the first is a hammer catalog of 47 pages, describing a large line of hammers manufactured by this company. These include carpenters' hammers, farriers' hammers, blacksmiths', engineers', machinists', boiler makers' hammers, etc. The other publication is entitled "A Captain of Industry," and is a story of David Maydole, founder of the David Maydole Hammer Co. This also contains a list of hammers made by the company, together with some useful tables, regarding weights of various shapes, sheets and bars; twist drill tables; areas and circumferences of circles; wrought iron pipe tables; composition of alloys, etc.

The Abner Doble Co., San Francisco, Cal., recently brought out a new catalog entitled "Doble Tangential Water Wheels." This is the company's first comprehensive catalog relating to hydraulic products, and contains 100 pages. The first portion of the catalog contains general matter descriptive of the Doble tangential water wheels, special attention being given to the needle regulating nozzle, ellipsoidal buckets, etc. Illustrations of different types of wheels are followed by descriptions of some of the Doble hydro-electric plants in which they are operated. The latter portion of the book contains the Doble water wheel tables, covering all conditions of water power up to a head of 2,550 feet, and in capacities up to 5,000 horsepower. Other tables relating to the loss of head in pipes, riveted steel pipe, etc., are given. Four pages are devoted to useful hydraulic information, and seven pages to a series of ready conversion factors, most of which have been compiled from a recent work by Carl Hering.

The Dominion Tariff commission has been taking evidence in the maritime provinces. At St. John N. B., the importers Association urged numerous reductions and objected to any duty being placed on tin plate.

CANADIAN ORE DEVELOPMENTS.

(Special Correspondence.)

Port Arthur, Ont., Jan. 22.—The Atikokan Iron Co., of this city, has made a contract with the Canadian Rand Drill Co. for a full installation of mining machinery for the property it is developing, 150 miles west of here. There is as yet no railroad into the mine, but the Canadian Northern passes only a few miles distant, and will be built in the coming spring. The machinery is to be taken in before the road gets there, at least as much of it as will be needed at once. There is to be a large jaw crusher, capacity 1,000 tons per 20 hours, with power, a Rand compressor and an outfit, at the start, of ten drills. The mine will be opened by tunneling and no hoisting machinery will be needed for many years.

This mine is being opened by the same parties as are building a 100-ton blast furnace at this city, together with beehive ovens, and a large dock, and are closely identified with the Canadian Northern road. They have made contracts with the Pittsburg Coal Co. for coking coal, and the latter company is erecting one of the largest docks in the world joining the blast furnace site, and will deliver coal to the ovens over a tram that will feed direct. An ore-shipping dock is to be put in also, for it is the plan of the iron company to make shipments of Bessemer ore to Canadian furnaces at the Sault and Hamilton and Midland.

It is said that negotiations have been considered with the Dominion Steel Co. for the shipment of ore to its furnaces. This company last year received a large amount of ore from the American side of the lakes, and would find it much more profitable if it could get ore mined in Canada. The same is true of the Lake Superior Corporation, with its works at the Sault. Its ore last year all came from the south shore of Lake Superior.

The Westinghouse Electric & Manufacturing Co., East Pittsburg, has received a contract from the Grand Trunk Railroad for the complete electrification of the system operating through the tunnel under St. Clair river between Port Huron, Mich., and Sarnia, Ont. The contract, which is the most important so far in the new year, calls for six 1,000 horsepower alternating current single phase electric locomotives, the electric power station equipment, the electric light plant and all additional railroad station and track apparatus. Work of constructing the machinery will begin at once.

LATE NEW YORK NEWS.

(Special Telegram.)

New York, Jan. 24.—The only notable contract taken by the American Bridge Co. during the week was for 1,400 tons of material for the Lake Shore.

Late pig iron sales in this section include from 5,000 to 10,000 tons of malleable Bessemer and the same quantity of basic.

Philadelphia Strike.—The Philadelphia strike situation is reported as extremely favorable. Judge McPherson of the United States district court last Friday issued a temporary injunction restraining fourteen members of the Iron Molders' Union of America from interfering with the non-union workmen of the Niles-Bement-Pond Co., by picketing the factory, assaulting the workmen and preventing molders from seeking work. Affidavits by a number of non-union workmen were read, relating how the strikers had thinned out the working force by these tactics. Counsel for the strikers claimed that as the Iron Molders' Union has not incorporated it could not be the object of an injunction. The judge thereupon issued the restraining order against the ring leaders of the strike, and will hear argument this week on the question of making it permanent.

CHICAGO METAL MARKET.

The downward tendency of copper continues, and prices have receded almost as rapidly as they ascended. Lake is now quoted at 18¼c to 18¾c Chicago for carload lots, and 19c to 20c in smaller quantities. Casting copper is also offered at 18¾c to 18¾c for carloads, and at 19c to 20c for less than carload lots. Tin has strengthened and is now quoted ½c higher than last week being 37c to 39c, according to quantity. Spelter is without change and is firm at 6.60c to 6.90c, carloads, and 7⅛c to 8½c for small lots. Pig lead is scarce and strong at 5.85c delivered in 50-ton lots desilverized, and 6¼c to 7c for smaller quantities. Antimony is without change at 14c to 14¼c for Hallett's, and 14½c to 15c for Cookson's. Nickel is 50c to 65c, according to amount and deliveries.

Copper and brass scrap have declined in sympathy with the relaxation in the New York market. At concessions, there is a fair demand, but the buying is without life or interest. We quote copper wire, 15¾c per pound; heavy copper, 15¾c; copper bottoms, 15c; copper clips, 15¾c; red brass, 14¾c; yellow brass, heavy, 11¼c; yellow brass borings, 10c; red brass borings, 12½c; light brass, 8c; pipe lead, 5c; tea lead, 4½c; zinc, 4¾c; tin foil, 28c; pewter, No. 1, 23c.

ILLUMINATED SIGN PRESENTED TO THE A. S. M. E.

At the recent meeting of the American Society of Mechanical Engineers, held in New York city, the secretary Prof. Hutton, called the attention of the members to the handsome electric sign which was mounted in one corner of the meeting room, and which is illustrated herewith. The sign is a monogram formed of the initial letters of the society's name, and stands about six feet high. Each letter is illuminated with electric lamps of a different color, these being red, white, blue and gold. Prof. Hutton stated that the sign had been constructed by the members of the society who were connected with the New York Edison Co., which had granted the society the use of the quarters which it occupied during the meeting. The sign was presented to the society by these gentlemen for use at future meetings.

A. S. M. E. ILLUMINATED MONOGRAM.

Effingham B. Morris, member of the board of directors of the Cambria Steel Co., is quoted as follows: "I think Cambria will be called upon to spend five or six million dollars in the next few years in various directions, viz., No. 8 blast furnace, additional by-product coke ovens, open-hearth furnaces, ore steamers on lakes, very large expenditures for increasing water supply for the Bessemer furnaces, etc., etc. It is merely prudence therefore to husband the profits in good years."

Jenkins Bros., 71 John street, New York, have issued a catalog of extra heavy valves for high pressure, listing five different types.

HOUSE MOVING

One of the Features of Activity on the Ranges—New Operations.

(Special Correspondence.)

Duluth, Jan. 23.—All residents on the Clark mine location, east of Hibbing, have been ordered off, and their houses are being moved to the south of the mine. The houses are hauled on an immense sleigh built for the purpose, and the work is very easily accomplished. A few years ago an office building for the Swan River Logging Co. was moved to Hibbing from a point 40 miles away on a flat car. The building is about 38 x 30 feet, and two stories high, and was successfully moved over the Great Northern tracks. So many Mesabi towns have been lifted bodily and moved to new situations, that the feat is accomplished without difficulty, and with no remark. The town of Sparta is to be moved the coming year, and a large part of Hibbing will have to hike after a while.

Early in February the old Kimball prospect near Crystal Falls will be unwatered, and miners can get down. It is to be thoroughly developed for a mine this year. There is an old shaft, sunk long ago. One of the Oliver company's draughtsmen at Hibbing recently fell into an old test pit there, a distance of 91 feet to the bottom, and was permanently crippled. He hit the soft snow, which doubtless saved his life. There are a great many old test pits on the range, and many of them are open, a trap for men and cattle, from which one is very fortunate if he escapes without death in the fall or by drowning.

The James tract, in the Iron river district, has been optioned to the Mineral Mining Co., and the old shaft will be unwatered and exploration started from it. The property was abandoned several years ago, though its indications are excellent. This Mineral Mining Co. is doing a lot of work, and it is generally understood that if it finds mines the Oliver company will have first chance to take them over. Officers of the Pewabic company are at the head of the company.

The Oliver company has built, and will open next week, a fine new dry at its Section 16 mine, Ishpeming. It is one of the model drys of the Lake Superior district. The same company is to have a very fine standard type machine shop for its Lake Superior group, at Ishpeming. It will have steel frame and brick walls, and will be fitted with tools for extensive repairs. The company already has a large shop at Hibbing, and so great has been the demand for work that it is now found necessary to add to it. This is one of the finest machine shops in the northwest.

The Leonard mine is sinking an incline shaft near the old one to make a new approach and get deeper without cutting a rock ledge.

Owners of about 1,000 acres near Crystal Falls have been closing a lease to the Monongahela and Quincey properties, both of which are in their holdings. They do not know the name of the leasing syndicate, which is supposed to be some operating mining company. The two properties produce, when they produce anything, a low grade non-Bessemer ore, and the Monongahela was operated by Jones & Laughlin in a small way before they got sufficient ore on the Mesabi to relieve their anxieties as to future supplies of raw material.

The Oliver Iron Mining Co. is to unwater its old Isabel, in Iron River. The property is to be thoroughly explored, something never before done. There is a shallow shaft with slight workings from it. The ore of that section is not high grade.

George St. Clair has leased the large tracts of the Mesabi Iron Co., all lying east of the old Mallman mine, which has been considered the most easterly deposit of merchantable ore on the Mesabi range. He is putting drills on the lands, which cover more than 8,000 acres, and expects to explore them this year.

The Consumers Ore Co., which is M. A. Hanna & Co., has taken an option and bond on some 800 acres of land in Mastodon town, Menominee district, and will explore for iron. Low grade ore is known to exist in undetermined quantity on these lands.

Ore of the usual Vermillion range quality has been hit in the shaft which the Shagawa Iron Co is sinking on section 30. This is at the point where ore was expected and is not yet a matter of much moment.

Stock Eagerly Taken.—There has been an unusually heavy demand by employes of the United States Steel Corporation for the preferred stock of the company recently offered at par. Subscriptions have already passed the 45,000 share mark and the demand in the Pittsburg district has been particularly heavy. It has been stated that 70 per cent of the employes at Homestead have subscribed.

The Cincinnati Industrial Bureau held its annual meeting and dinner on Wednesday evening, January 24. Mr. Wm. Lodge, of the Lodge & Shipley Machine Tool Co., president of the Bureau, presided and officiated as toast master.

STERLING COAL & COKE CO.

Formed to Develop Coaling Coke Lands in Interests of the Pickands-Magee Coke Co.

Application has been made at Harrisburg, Pa., for the incorporation of the Sterling Coal & Coke Co., with a capitalization of $500,000 and owning about 500 acres of coking coal lands in the Connellsville district, in the interests of the Pickands-Magee Coke Co., of Pittsburg. The company is formed by stockholders in the Southern Connellsville Coal & Coke Co., Masontown Coal & Coke Co., and other adjacent interests, which in all will give in the neighborhood of 1,100 coke ovens to the Pickands-Magee Coke Co., which, when the new proposition is completed, will control four and one half miles of river frontage near Fayette City, Pa., on the Monongahela river. The Pickands-Magee company now has 225 ovens at Masontown, 262 at South Connellsville and will have 300 at the new Sterling Coal & Coke Co., plant and 200 more are to be added to the Southern Connellsville plant.

The stock of the new Sterling Coal & Coke Co., has all been subscribed and will be used to develop the property, opening mines and building coke ovens. The coke plant will consist of 300 ovens, and a mining town with miners' homes, storeroom and other facilities, all to be provided on a modern basis. It is designed to produce coke during the present year. The leading interests owning stock include T. W. Seamans, E. S. Hackney, G. B. Buchinal, J. C. Fulton, J. R. Carouthers, Geo. Whyel, Harry Whyel, of Uniontown; S. J. Harry, Connellsville; Thos. Morrison, D. M. Clemson, P. F. Smith, W. M. Hall, Pittsburg; John Husband, Mt. Pleasant, Pa.; W. W. Lawrence, New York; S. W. Croxton, Cleveland, and R. Hobson, Hamilton, Ont. The officers are: W. C. Magee, president; George Whyel, vice president; and T. W. Seamans, secretary and treasurer.

The Berger Mfg. Co., of Canton, O., has just made a large shipment of galvanized steel Spanish tile roofing and trimmings, for a residence being erected under the supervision of Messrs W. S. Bell & Co. of Albany, Ga.

A. E. Hoermann, mechanical engineer at 261 Broadway, New York, who represents the Curtis & Co. Mfg. Co., the Dayton Pneumatic Tool Co. and I. F. Slocomb & Co., has been awarded contracts for the complete pneumatic equipment, consisting of hoists, jib and traveling cranes, compressor, etc. to be erected at the Wire & Telephone Co. of America, Rome, N. Y.

BREAKING UP COMBINES.

Canadian Authorities Vigorous in Crusade Against Alleged Illegal Associations.

Toronto, Can., Jan. 23.—The prosecutions instituted against members of numerous illegal trade combines, including many manufacturers and dealers in iron and steel products, are being vigorously pushed. On the 15th inst. 39 members of the Master Plumbers' Association, in addition to those previously dealt with, found guilty of receiving dividends on contracts the price of which had been raised by combination, were fined in amounts ranging from $200 to $500. About 70 others, mostly small tradesmen, were allowed to go on suspended sentence. The taking of evidence in the preliminary investigation of the charges against the members of the Canadian Tack Manufacturers' Association was concluded on the 15th. The evidence taken was very voluminous, including extensive extracts from the minutes of the Association, and correspondence with the secretary, indicating that ever since 1892 agreements had been in force for maintaining prices and limiting the output of tacks. Police Magistrate Denison enlarged the case until the 24th, to allow of the evidence being copied and intimated that he would send most of the defendants to a higher court for trial.

The affairs of the Henderson Roller Bearing & Mfg. Co., Ltd., are in litigation. On the 13th inst. Chief Justice Falconbridge on the petition of the Ontario Bank and others, granted a winding up order against the company. A stay of proceedings was afterwards granted and on the 16th the Toronto Roller Bearing Co., which held a large amount of stock in the Henderson Co., moved for the setting aside of the winding up order. The case is still before the court. The capital stock of the company is $1,000,000, of which $859,000 has been subscribed, but of this amount $281,665 remains unpaid.

The Dominion Tariff Commissioners heard representatives of the steel and coal industries at Sydney, N. S., on the 12th inst. C. S. Cameron on behalf of the Dominion Iron & Steel Co., asked for a continuance of the bounty system and a duty on barbed and galvanized wire. General Manager F. P. Jones strongly favored the anti-dumping clause. Harvey Graham of the Nova Scotia Steel & Coal Co., and Alex. Dick of the Dominion Coal Co., urged that the Cape Breton coal companies were dependent on the St. Lawrence market, where competition with both American and English coal had been keenly felt. Without the present duty of 60 cents per ton on bituminous coal the production would be reduced one half.

A report of D. H. Ross, Canadian commercial agent at Melbourne, Australia, just published, indicates a considerable degree of activity on the part of Canadian manufacturers in seeking new markets in that country. Importations of Canadian agricultural machinery are increasing. The State of Victoria had imported during the previous three months quite 3,000 tons (measurement) of Canadian agricultural implements and, adding the other states, the total importations exceeded 6,000 tons, besides which there were further large shipments to arrive.

TWO HEAVY COAL CONTRACTS.

Two contracts calling for the delivery of 3,000,000 tons of coal within the next five years have been closed in the Pittsburg district within the past week. The Pittsburg Steel Co., the largest independent wire interest in the country, closed with the Pittsburg Coal Co., for 1,000 tons per day, or about 350,000 annually over the next five years, delivery to be made to the plants at Monessen and Glassport, in the Pittsburg district.

The Midland Steel Co., which is now constructing an immense plant at Midland, Pa., twenty miles below Pittsburg on the Ohio river, has closed for 250,000 tons annually for five years, delivery to be made at the Midland plant, and the coal to be used for fuel and coking purposes, the company now having under way the construction of 350 modern coke ovens. The contract by the Midland Steel Co., was with the Monongahela River Consolidated Coal & Coke Co.

The Pittsburg Steel Co., is now assured of its supply of raw material and fuel for the next five years, having closed last June with the Carnegie Steel Co., for 1,000,000 tons of Bessemer and open-hearth steel billets a year for five years.

Open Shop in Building.—At a special meeting of the National Association of Erectors of Structural Steel and Iron Work at the Building Trades Club, New York, on January 19, it was decided by acclamation to insist hereafter upon the principle of the open shop. Delegates were present from Pittsburg, Chicago, St. Louis, Milwaukee, Boston, Philadelphia, Minneapolis, Washington and about twenty other cities. The action taken means that the International Association of Bridge and Structural Iron Workers and the local affiliated bodies will no longer be recognized.

CARNEGIE RELIEF FUND.

Disbursements During 1905 Were Heaviest Since Endowment Was Made.

The fourth annual report of the Carnegie Relief fund, F. M. Wilmot, manager and J. B. Erskins, assistant manager, has been made public. The disbursements are larger for the year 1905 than during year since the fund was established through endowment by Andrew Carnegie.

The report shows for the year a total disbursement of $266,290.15 of which amount $96,187.80 was paid in accident benefits; $123,249,000 in death benefits and $46,853.35 in pension allowances. The total for 1904 was $241,988.32; divided $128,471.57 in accident benefits, $76,943 in death benefits and $36,573.75 in pension allowances. In 1903 the total disbursement was $180,652.17; divided $106,655.37 in accident benefit, $46,824 death benefit and $27,172.80 in pension allowances. In 1902, the first year of the fund the total disbursement was $48,213.85, of which $19,700.90 went for accident benefits; $16,316 for death benefit and $12,196.95 for pension allowances. The grand total for the four years since the fund was established has been $737,144.49 disbursed; divided as follows: accident benefits, $351,015.64; death benefits, $263,332; pension allowances $122,796.

The past year showed a big increase in death benefits, $123,249 for 1905 as against $76,943 in 1904. The accident benefits show a corresponding decrease, $96,187.80 in 1905 as against $128,471.57 in 1904. At the opening of the new year it was shown that 39 accident benefits were being paid, 263 death benefits and 331 pensions.

The Carnegie Relief fund manages the disposal of the benefits from $4,000,000 given by Andrew Carnegie as an aid to employes of mills, furnaces, and other properties of the Carnegie Steel Co., together with all the steel corporation has had merged with them since the establishment of the fund, which became available January 1, 1902. With the exception of the first two years the benefits drawn from the interest of the endowment have been in excess of the actual earnings of the endowment. Any amount over $200,000 must be taken from the sinking fund and the past year witnessed the withdrawal of $66,290.15 from this fund.

Metal Trades Convention.—The annual convention of the National Metal Trades Association will be held on March 21 and 22 at the Hollenden Hotel, in Cleveland, Ohio and will be preceded by a meeting of the Administrative Council of that Association on March 19 and 20.

PERSONALS.

Andrew Telfer Jr., will succeed his father recently resigned, as superintendent of the Syracuse branch of the National Tube Co.

Daniel J. Morrell and Edward Y. Townsend are the names selected for the two 600-ton freighters building for the Cambria Steel Co.

J. A. Hanna, of Cleveland, has been elected a director of the Niles Car & Mfg. Co., Niles, O., succeeding William Herbert.

Edward Holth has resigned as chief engineer of the Dominion Iron & Steel Co., Sydney, N. S., and will spend considerable time in travel. His successor has not yet been decided upon.

George Davies, connected with the Cincinnati office of the Republic Iron & Steel Co., has been chosen manager of the Ashland Steel Co.'s plant at Ashland, Ky., succeeding George H. Fisher.

John F. Stevens, chief engineer of the Isthmian canal, has been elected a vice president and director of the Panama Railway Co., filling the place of John F. Wallace, resigned.

C. H. Hallgath, auditor and purchasing agent of the Columbus Iron & Steel Co., Columbus, O., has resigned to enter another line of business after being connected with this company for about six years.

G. P. Bassett Jr., until January 1 Pittsburg resident manager for Rogers, Brown & Co., has established himself in the pig iron and coke brokerage business, with offices at 100 German National Bank Building, Pittsburg.

Edward Brush has resigned his position as secretary of the American Smelting & Refining Co., to assume new duties as vice-president and assistant to the president. W. E Merwiss becomes secretary, with G. M. Borden as assistant.

James L. Pilling has associated himself with the Railway Appliances Co., Chicago, which will receive inquiries relative to improved compressed air locomotive turn-table devices, and hoisting engines both portable and stationary, all equipped with the Pilling improved engines.

J. Clare Miller, now sales agent of the Columbus Iron & Steel Co., will take service with the Domhoff & Joyce Co. on February 1. E. C. Humphreys, now with the United States Cast Iron Pipe & Foundry Co. at Chicago, will also go with the Domhoff & Joyce Co. at that time.

Edwin J. Watson, for some time superintendent of the North Works of the Worcester Works of the American Steel & Wire Co., will act as personal representative in the eastern plants for General Superintendent C. L. Miller, Pittsburg. Samuel Rogers will succeed him as superintendent of the North Works.

Joseph G. Walton severed his connection with Matthew, Addy & Co. on January 22 and took service with the Robert Field Sales Agency on that date.

H. A. Forsyth, one of the best known pig iron salesmen in Chicago, has associated himself with A. H. Carpenter, the Chicago manager of sales of the Tennessee Coal, Iron and R. R. Co.

C. P. Wheeler, vice president and treasurer of Pickands, Brown & Co., Chicago, sailed Saturday, January 20, on the steamer America for a three months' stay in France and Switzerland. Mr. Wheeler was accompanied by his wife and daughter.

The Swedish Royal Academy of Sciences has elected Prof. Henry M. Howe, of Columbia University, New York, a foreign member. Alexander Agassiz, Thomas A. Edison, Prof. Simon Newcomb, Prof. S. P. Langley and C. R. Van Hise are the only other Americans who have been honored by membership in this organization.

David S. Pyle, superintendent of the New Castle plants of the American Sheet & Tin Plate Co., has had his jurisdiction extended to include the Sharon mills, of which Thomas P. Rees, formerly connected with the New Castle plant, becomes superintendent. They succeed D. H. Williams and John A. Jones, respectively general and night superintendent of the plant at Sharon.

J. G. Mustin, general superintendent of the Braddock mills of the American Steel & Wire Co., has been transferred to the Allentown, Pa., works of the company to assume the general superintendency made vacant by the resignation of E. B. Douglass. Frank Nullmeyer, assistant superintendent at the Donora plant, succeeds Mr. Dustin at Braddock.

A. J. Caldwell has resigned as commissioner of the National Founders' Association to which position he was chosen at the annual meeting late in November. His resignation has been accepted and the Administrative Council of the association is now considering the selection of a successor. Until a choice is made President Briggs will aid the assistant commissoner, Mr. McClintock, and his associates in conducting the affairs of the office.

F. J. Ellis will succeed T. J. Bray as chief engineer for the United Engineering & Foundry Co., of Pittsburg. Mr. Bray has resigned to become assistant to President Topping, of the Republic Iron & Steel Co., in charge of engineering and construction work. The heads of departments, including President I. W. Frank, superintendents of the various plants, chief clerks and members of the sales, engineering and auditing department, of the United Engineering & Foundry Co., to the number of about 30 on Tuesday evening of this week tendered an informal farewell dinner to Mr. Bray, at the German Club, Craft avenue, Pittsburg.

OBITUARIES.

Salisbury Hyde, secretary and treasurer of the Washburn Car Wheel Co., Hartford, Conn., died Jan. 11 at the age of 75 years.

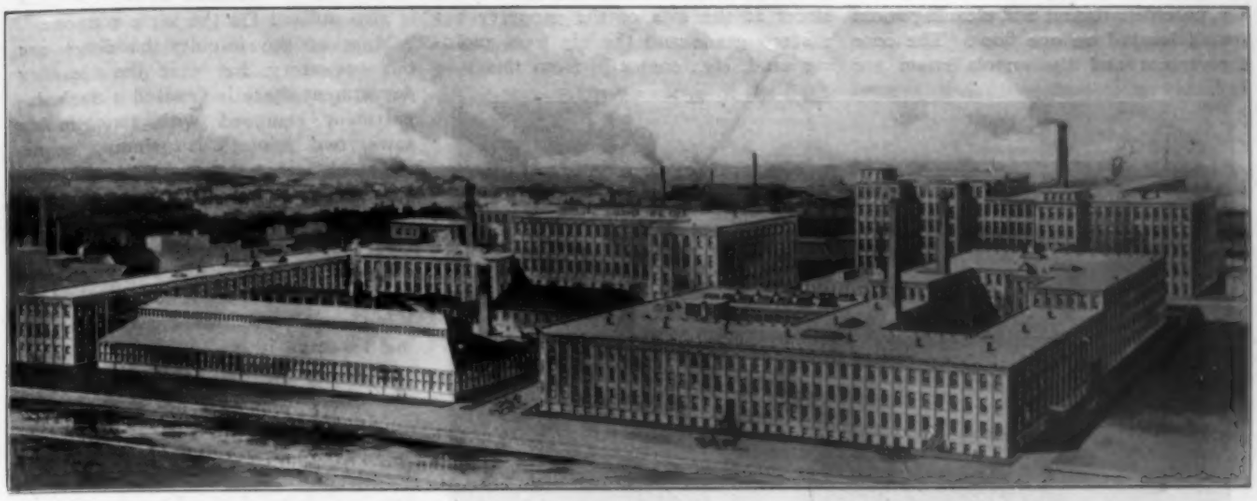
Ernest Bell, superintendent of the structural department of the Illinois Steel Co., died recently from lockjaw, resulting from the injury of one of his hands at the works.

William P. Allen, of the William Allen Sons Co., manufacturer of boilers, Worcester, Mass., died Jan. 4, at the age of 54 years. He leaves a widow and three sons, the eldest, William G. Allen, being manager of the business.

William Hutchison, a pioneer iron and coke manufacturer of Pittsburg, died at his home in that city Jan. 18. He was born in Ireland in 1826, coming to Pittsburg twenty years later. He built the Keystone Iron Works and was for many years a member of the firm of Hutchison, Glass & Co., iron manufacturers. In later life, however, he devoted his attention to the coke business.

Want Sunday Work Stopped.—The ministers of New Castle, Pa., have addressed an appeal to the stockholders of the United States Steel Corporation asking them to shut down the New Castle plant on Sundays if it is possible to do so. One of the arguments in favor of the closing advanced by the ministers is that the plants were not operated on Sunday before they became the property of the steel corporation. The appeal is not made to the officers of the corporation but to the stockholders as the ultimate source of authority, to demand of their officers and directors that all work on Sunday not absolutely necessary cease at once in all the mills, furnaces, yards, etc., belonging to the company.

The Stowe-Fuller Co., Cleveland, manufacturing fire brick, tile and cements, has materially enlarged its plants during the past year and on Feb. 1 will establish at 711 House Bldg., Pittsburg, an office for the sale of its products. It will be in charge of W. N. McKnight and John Reid Jr.



VIEW OF THE BROWN & SHARPE PLANT, WITHOUT SOME RECENT ADDITIONS.

A LARGE MACHINE TOOL MANUFACTORY.

The Works of the Brown & Sharpe Mfg. Co., Providence, R. I.

BY AN EDITORIAL REPRESENTATIVE OF THE IRON TRADE REVIEW.

Much has been written at different times concerning the history and the growth of the Brown & Sharpe Mfg. Co., but the engineer of today is interested primarily in the produet of the plant, and secondarily in its general arrangement for the carrying on of the work in a most expeditious and economical manner rather than in its history. The conditions governing the details in the arrangement of any plant have to be worked out for that particular plant, and will not apply as a whole to other similar concerns; but the engineering experience gained in one large works is always of value to those engaged in similar lines of manufacture.

The first machines designed and marketed by this company embodied the largest possible degree of accuracy combined with convenience, and it has continued this policy through all of its products. Today the firm manufactures a very extensive line of machine tools, and also a line of machinists' tools.

Some idea of the size of the works may be had from the fact that the plant now contains over 15 acres of floor space and employs more than 3,000 men. In so far as is possible the works have been divided into departments for manufacturing different classes of machines. For instance, there is a milling machine department, a screw machine department, etc. There is also a small tool department for manufacturing micrometers, gauges, steel rules, and other machinists' tools.

The work of this company in the development of accurate standards is well known, and a considerable portion of the output of the small tool department consists of accurate gauges and measuring machines. Practicability has always been the first consideration and the tools are made to be used rather than along strictly theoretical lines.

CUPOLA CHARGING FLOOR.

Foundry Department.

The foundry department of this company has always been noted for accurate, high grade gray iron castings, and hence it is but natural that the foundry should have supplied not only the castings necessary for the machines manufactured by the company, but also some high class castings for the general jobbing trade. While at present the manufacturing departments take practically the entire output of the foundry, it is, nevertheless, true that a small amount of jobbing work is still done.

In the foundry department the same careful attention to details which is shown in the design of the machine tools manufactured by the company is shown in many ways. For instance, a special type of core oven was designed for the use of the company. A special form of annealing furnace was also designed for its own use and later put on the market.

The new foundry plant is the result of a large amount of careful thought and study, and has been constructed to meet the requirements of the case. The

heavy work foundry, light work foundry, core department and cleaning room are all located on one floor. The core department and the cupola room are placed between the heavy and light work foundries, and two of the large core ovens are so constructed that the cores are placed on trucks in the core room, run into the ovens for drying and then out of the back end of the ovens into the heavy work foundry for use. This reduces handling to a minimum. At one end of the various foundry buildings is located a series of 24 storage bins of concrete construction. These bins are used for storing sand, fire-clay, sea-coal and other supplies. The bins are filled through openings in the roof from trucks or wagons which come in on the level of the cupola charging platform. The pig iron is stored on top of the bins also on the level of the cupola charging platform.

MAIN BAY IN HEAVY WORK FOUNDRY.

At the back of the bins referred to and above them there is a large concrete coke bin which holds an entire winter's supply of coke. The top of the coke bins is on the level of the street at the back of the property so that wagons bringing the coke come in at the street level. The street at the side of the property has a steep grade and the pig iron, molding sand, etc., comes in from this side street on the level with the top of the storage bins.

The charging platform about the cupola is large enough to accommodate a sufficient number of trucks to take care of the entire day's charge.

The storage of heavy foundry rigging, plates, etc., is always a problem, but this has been very well solved in the case of the foundry under consideration by placing a traveling crane between the end of the storage bins and the foundry beneath which the heaviest flasks and pieces of rigging are stored. A portion of the area above the bins is also utilized for the same purpose.

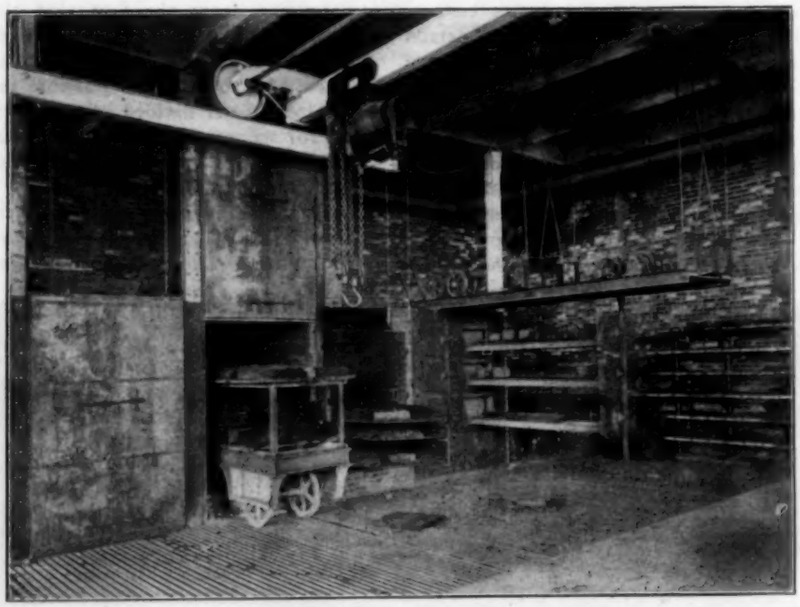
COKE BIN ON TOP OF MOLDING SAND BINS.

Note—This picture was taken before the building and construction of the bins.

Most of the foundry buildings are but one story, but over the cleaning department there is situated a flask department equipped with two double saws, two jointers, a grinding stone, a 16-inch lathe, a 36-inch lathe, several carpenters' benches, and other machinery necessary for making flasks, or rigging, or for repairing patterns. The elevator which connects this floor with the one below is made long enough to bring up 18-foot lumber without having to stand it on end.

Ajoining the foundry on one side is the storage building, the first floor of which is taken up with the storing of castings which have been made and are waiting until they are required in the machine shop. The offices for this department are also situated on this floor, as is also the shipping room. The second floor contains a wash room, locker rooms, etc., for the foundry. Above this are four floors for pattern storage. This building is of steel construction, the steel being fireproofed with concrete. The pattern storage rooms are made with low ceilings so that a man can take the patterns from the shelves without the aid of a ladder.

The arrangement in the wash room is of interest. Each one of the wash or bath rooms is provided with a slat floor, and a small bench upon which there is a galvanized iron foot tub into which the workman draws the water for his bath. The lockers are arranged in rows at right angles to the bath room, and are provided with expanded metal doors. Between each row of



FOUR OF THE CORE OVENS.

lockers there is a bench for the use of the men while dressing.

The foundry roofs are all constructed with a north light which shows very plainly in the interior view of the heavy work foundry.

Power Plants.

The power for the works is furnished by several power plants located in different buildings, it having been necessary to add to the power plant equipment as the works grew. The original power plants were all steam plants and the machinery was driven directly by shafting, and this system is still used in several of the buildings. Some machinery, however, is driven by electric motors, and the power plant which has been installed in connection with the foundry consists of a battery of gas producers and a large gas engine which operates an electric generator.

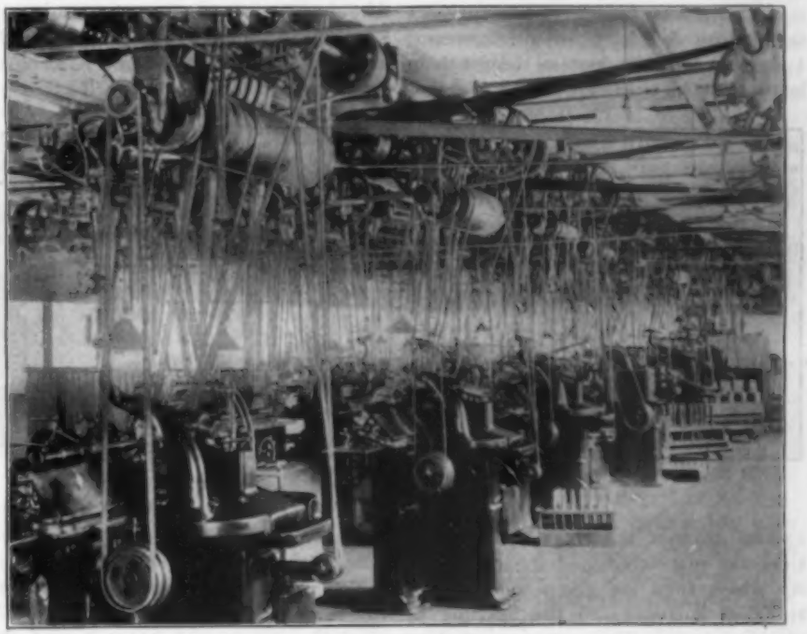
Manufacturing Departments.

It is not practicable to attempt to take up each one of the different manufacturing departments in detail in a description of this kind. It has already been stated that so far as possible the manufacturing was systematized as to the product, certain departments being devoted to the manufacture of certain products.

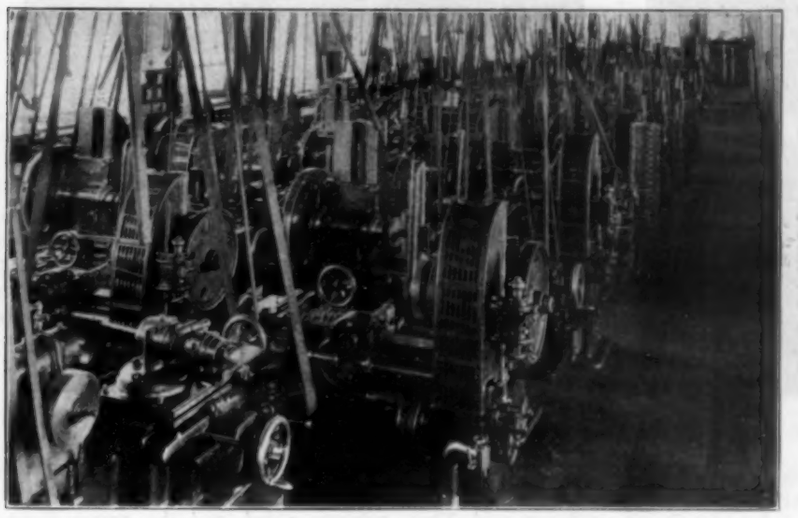
There is another group which runs through the works in accordance with which some of the work is classified according to operations. For instance, there is a grinding department in which are situated the machines for grinding spindles and other parts for all of the machine tools manufactured. There is a screw machine department for making small duplicate parts, a polishing department for this class of work, a milling machine department for milling operations and a gear cutting department. The gear cutting department is worthy of more than a passing notice, as the Brown & Sharpe Co. has long been noted for the accuracy of its gears.

The accompanying views of the back and front of a special gear model show the many forms of gearing developed by this company, all of which were cut in its gear department, which is equipped with all classes of gear cutting machines.

The heavier parts of some of the machines, as, for instance, the milling machines, are machined in the same room in which they are erected. The smaller parts are then brought from the various manufacturing departments upon trucks. By this means the heavier pieces receive a minimum amount of handling, and a machine is assembled and tested with the smallest possible amount of dead work; that is, unnecessary handling. When the machines are assembled and tested they are then trucked to the shipping room.



GRINDING DEPARTMENT.



GEAR CUTTING DEPARTMENT.

There is one department which has not been mentioned so far, the influence of which is felt throughout the entire works, and that is the tool making department, where the jigs, fixtures and special tools are made. Very few firms pay as careful attention to the manufacturing processes as is the case in the plant under description. Wherever it is possible to use automatic or standard machinery for manufacturing processes it is done, and where not possible, accurate jigs, tools, fixtures and gauges are made to insure duplicate work.

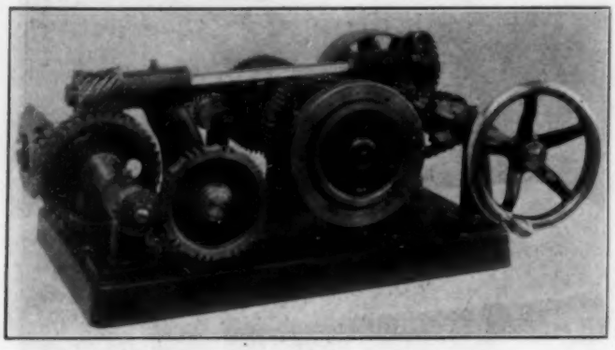
WASH ROOMS AND LOCKERS.

The drafting and designing room is also a very important factor in the

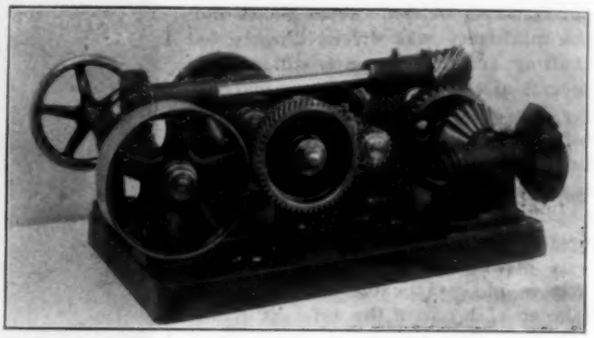
Brown & Sharpe plant, as in it both the standard and special tools and machines are designed.

Apprenticeship System.

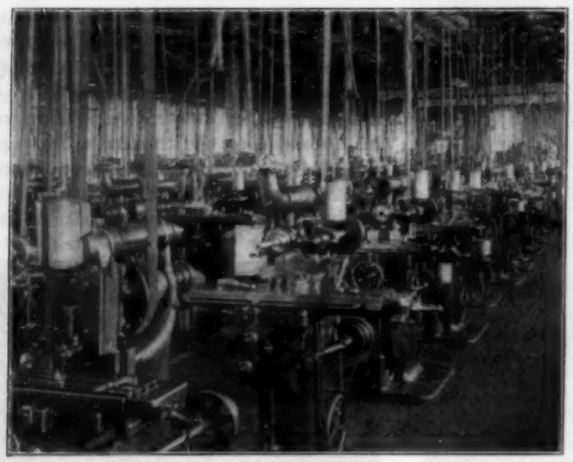
It has frequently been stated that the apprenticeship system was dead, and that there was no place where a boy could learn a trade. Anyone who visits the Brown & Sharpe plant, however, and looks into its system, cannot help being struck with the thorough and careful manner in which the apprentices are instructed, and the opportunity which they are given to learn the trade as it applies to the building of machine tools. The company employs a man whose duty it is to go through the works and instruct the boys as to the proper method of carrying on their work. He has nothing to do with furnishing the boys with the work, but is supposed to give them whatever instruction is necessary. The foreman is too busy to do this, and it is not fair to ask the journeymen in the shop to do it, but the appointing of special men for this purpose certainly is the best system that we have met. Once or twice each month the apprentices are called together and given a talk on some subject in connection with their work. They are also looked after in every way that may be consistent.



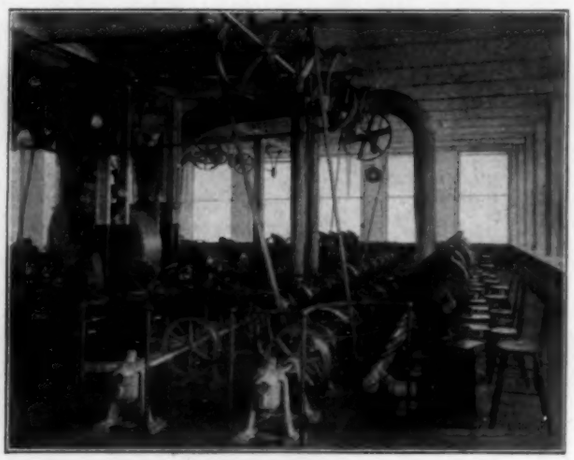
FRONT OF GEAR MODEL.



BACK OF GEAR MODEL.



MILLING MACHINE DEPARTMENT.



POLISHING DEPARTMENT

THE USE OF AMMONIUM PERSULPHATE IN THE DETERMINATION OF CHROMIUM IN STEEL.*

BY HARRY E. WALTERS.†

Ammonium persulphate is used as a reagent for oxidizing chromium in steel in a method described by F Ibbottson and R. Howden. After oxidation the chromium is precipitated as lead chromate, filtered and determined volumetrically.

The writer has been using a method for some time in which the same salt is used, advantage being taken of the fact that in the presence of sufficient silver nitrate both the chromium and manganese are completely oxidized and can be determined volumetrically without previous precipitation. The method as outlined is applicable for ordinary chrome steels, but not for tungsten or molybdenum steels, as some of these steels contain a carbide of chromium insoluble in sulphuric acid. This difficulty can be overcome by filtering the insoluble carbide, burning and fusing with a small amount of sodium carbonate and adding to the main solution. This, however would prolong the operation but would still be an advantage over the methods now in use.

Method.

Weigh 125 grammes of the sample into a No. 3 Griffin beaker, add 35 c.c. sulphuric acid (1 acid to 5 water), warm until sample is in solution and add a small amount of ammonium persulphate to oxidize the iron and carbonaceous matter, dilute to 100 c.c. and add 40 c.c. silver nitrate solution (0.16 gram of the salt); now add an excess of ammonium persulphate (5 to 7 grammes) and heat to boiling. Boil about five minutes to destroy excess of persulphate, cool and transfer to a 500 c.c. calibrated flask, dilute to mark with water and mix thoroughly.

Pour 100 c.c. (.25 gramme) into a 100 c.c. calibrated flask; the remaining 400 c.c. (1 gramme) are transferred to a beaker, a measured volume of ferrous sulphate added, and the excess titrated with a standard solution of permanganate until a pink color is obtained.

The number of cubic centimeters of the permanganate solution used subtracted from the number required for the volume of ferrous sulphate added, will give the volume of permanganate

*Read before the Chemical Section, Oct. 19, 1905.

†Laboratory United Engineering & Foundry Company, Lincoln Foundry Department, Pittsburg, Pa.

used by the chromium and manganese.

The contents of the 100 c.c. calibrated flask are transferred to a porcelain dish and titrated with a standard solution of sodium arsenite until the color is bright yellow. The number of cubic centimeters of the arsenite solution used, multiplied by the value of the solution in manganese, will give the amount of manganese present.

The volume of permanganate used by the chromium is found by calculating the amount of manganese found to the equivalent number of cubic centimeters of the permanganate solution and subtracting this number from the volume of the permanganate used by the chromium and manganese. The number of cubic centimeters found to be used, multiplied by the value of the permanganate in chromium, will give the amount of chromium present.

Example:—Let us assume that the chromium value of each cubic centimeter of the permanganate solution equals 0.001 gramme, and the manganese value 0.000633 gramme; now if 50 c.c. of the ferrous sulphate solution equals 49 c.c. of the permanganate solution, and the sample after oxidation and addition of 50 c.c. of the ferrous sulphate solution requires 13 c.c. of the permanganate solution, then 49 c.c. minus 13 c.c. equals 36 c.c. or amount used by chromium and manganese.

If the sample should show 0.38 per cent manganese by the arsenite titration, then 0.0038 divided by 0.000633 equals 6, or the number of the cubic centimeters of permanganate solution equivalent to the per cent of manganese found.

36 c.c. minus 6 c.c., or 30 c.c. multiplied by 0.001 equals 0.03 gramme or 3 per cent chromium.

Reagents.

Sulphuric Acid—A mixture of one part concentrated acid and five parts water.

Silver Nitrate—Four grammes of the salt are dissolved in one litre of water.

Ammonium Persulphate—The salt should be slightly moist.

Sodium Arsenite—The solution is prepared as recommended by Blair (Chemical Analysis of Iron, 5th Edition, pp. 121), The solution is standardized with a chrome steel of known manganese content so that the direct reading will give the percentage of manganese. Mixtures of pure chromium and manganese solutions may also be used.

Permanganate Solution—The solution is made by dissolving 1.82 grammes of pure potassium permanganate in 1 litre of water.

Ferrous Sulphate Solution—The solution is made by dissolving 22.5 grammes ferrous ammonium sulphate in water, adding 50 c.c. strong sulphuric acid and diluting to 1 litre.

It is unnecessary to have this exactly equal the permanganate solution, as a constant volume is used and the solution loses its strength. It is only necessary to find the volume of permanganate equivalent to the volume of ferrous sulphate used, and this should be done every day.

The permanganate may be standardized by getting the iron value or by the use of a pure chromium salt.

If the solution is standardized against iron the chromium value is found by the equation

168 : 52.14 : : iron value : chromium value

and the manganese value by the equation.

280 : 55 : : iron value : manganese value

If the solution is standardized with pure chromium salt the manganese value is obtained by the equation.

200.7 : 105 : : chromium value : manganese value

Remarks.

In case the samples should run high in chromium the ferrous sulphate solution should be made stronger.

The permanganate solution should be allowed to stand several days before standardizing.

In case an appreciable amount of vanadium is present in a sample it will be necessary to determine the manganese by the bismuthate or Ford's method.

The moist ammonium sulphate is recommended on account of difficulties encountered, when using the dry salt, in determining lead and manganese in previous work. These difficulties were surmounted when the moist salt was used.

In using the method for tungsten steels some tungstic acid separates, but this does not seriously interfere with the titration.

The following results were obtained on some chrome steels and pure solutions of iron, chromium and manganese.

No.	Per cent chromium taken	Per cent found	Per cent mang. taken	Per cent found
1	4.00	3.98	0.08	0.09
2	4.80	4.82	0.40	0.40
3	1.56	1.53	0.24	0.23
4	3.60	3.57	0.80	0.81
5	5.10	5.12	0.50	0.49
6	8.00	8.03	0.32	0.32

Steels	Per cent chromium	Chlorate method, per cent mang.	Per cent chromium	Persulphate method, per cent mang.
1	1.50	0.35	1.51	0.36
2	2.88	——	2.85	0.14
Tungsten	3.50	0.12	3.49	0.13
Molybdenum	5.69	0.81	5.71	0.83

REPUBLIC APPOINTMENTS.

S. B. Kerr Becomes General Sales Agent — Bray and Guthrie Placed.

President John A. Topping, of the Republic Iron & Steel Co., has announced the appointment of S. B. Kerr, now with the Crucible Steel Co., of America, as general sales agent for the company to succeed George A. Baird, resigned. T. F. Bray, for five years chief engineer of the United Engineering & Foundry Co., Pittsburg, has been appointed assistant to the president in charge of engineering and construction and T. W. Guthrie, late secretary of the executive committee of the Republic Iron & Steel Co., has been appointed assistant to Mr. Topping, in charge of coal and coking departments.

S. B. Kerr, the newly appointed general sales agent, has been for the last four years in charge of the plow and soft steel department of the Crucible Steel Co., with offices in the Frick Bldg., Pittsburg. The earlier part of his business training was in connection with the LaBelle Steel Co. When it was merged in 1900 with a number of other concerns to form the Crucible Steel Co., he went with the American Steel Hoop Co., but in a short time assumed the position with the Crucible company which he now leaves.

T. W. Guthrie, now assistant to president John A. Topping, of the Republic Iron and Steel Co., was formerly assistant superintendent of the St. Paul division of what is now the Chicago & Great Western Railroad. Later he became secretary and general sales agent for the H. D. Turney Co., of Columbus, O., Hocking Valley coal operators, and later as secretary of the Congo Coal & Mining Co. He then became secretary and general sales agent for Turney & Jones Co., and in 1898 was appointed general manager for the receivers of the latter concern. Mr. Guthrie became general manager of the reorganized Congo Coal & Mining Co., until in 1902 it was sold to the Continental Coal Co., when he became president and general manager of the Continental Coal Co., one of the largest concerns in the Hocking Valley, with headquarters at Columbus, O. On Sept. 1, 1905, the Continental Coal Co. sold to the Sunday Creek Company. On Oct. 20, 1905, Mr. Guthrie became secretary to the executive committee of the Republic Iron & Steel Co., with headquarters in New York, and served in this capacity until Jan. 11, of the present year, when, owing to changes in the executive committee and the death of Mr. C. S. Guthrie, chairman of the board, he resigned and President Top-

ping asked the authority of the committee to appoint him an assistant, in charge of the coal and coking departments.

T. J. Bray, who has been appointed assistant to the president, will have charge of all engineering matters and construction work for the Republic Iron & Steel Co. For the past five years he has been chief engineer for the United Engineering & Foundry Co., of Pittsburg. Mr. Bray was born in Pittsburg and educated in the public schools of that city. He served as an apprentice with the Lewis Foundry & Machine Co., and later went into the drafting department, remaining in all six and one half years with that company. He left in 1890 and took a course in mechanical engineering at Lehigh University and graduated with the class of 1894. Mr. Bray then went with the Ohio Steel Co., at Youngstown, now a part of the Steel Corporation, remaining during the construction of its plant, and then became associated with McGill & Co., of Pittsburg, first as engineer and then as secretary. Upon the formation of the United Engineering & Foundry Co., of which McGill & Co., are a department, Mr. Bray became chief engineer and has held that position five years. His headquarters as assistant to president Topping, of the Republic Iron & Steel Co., will be in Pittsburg.

ATIKOKAN IRON CO.

At the annual meeting of the Atikokan Iron Co., Ltd., Port Arthur, Ont., directors were elected as follows: William MacKenzie, president of the Canadian Northern Railway; D. D. Mann and Z. A. Lash, vice president and counsel respectively of the same road; Hugh Sutherland, Winnipeg; A. Stafford White, Chicago; J. W. deC. O'Grady, general manager Northern Bank of Winnipeg; R. M. Hunter of Duluth; and J. C. Hunter of Port Arthur. Of these Wm. MacKenzie was chosen president; J. C. Hunter, vice president and general manager; Hugh Sutherland, secretary and R. M. Hunter, treasurer. Messrs. Sutherland, Lash and J. C. Hunter make up the executive board. The company has completed the foundations for its blast furnace, stoves, boilers, coking ovens, roasting plant, engine house and trackage approaching the works. Contracts have been let for the superstructure with the idea of being ready to blow in by Aug. 1 next. Its mines on the Atikokan Range are equipped, a branch line from the Canadian Northern is under construction, and the company expects to be able to handle from 600 to 700 tons of ore per day by May 1.

NEWS OF THE TECHNICAL SCHOOLS.

Equipment for Armour Institute—New Automobile Testing Plant at Purdue—Opening of Carnegie Technical Schools.

At Armour Institute one of the busiest years in its history has been inaugurated, the enrollment of the engineering and scientific departments numbering in the neighborhood of 1,000, with evening classes having an attendance of 400. New and special courses in engineering drawing, mathematics, fire protection and telephone engineering have been instituted this year and are proving to be a success in every respect. New equipment is being added constantly. In the mechanical department a new 50,000-pound testing machine, an air compressor, and a steam turbine, a transmission dynamometer, a thermo-electric thermometer and an 8 x 10 steam engine have been installed. The electrical department has added to its apparatus a 25 horsepower variable speed motor, a 25 horsepower alternating current motor, a balance set, an induction regulator and a Cooper Hewitt lamp. A number of levels and transits have been placed in the civil engineering department and the school of chemistry has received a Sturtevant grinder and a centrifugal machine for phosphorus. Still further appropriations are to be made in the near future which will add in a large measure to the adequacy of the laboratory.

Purdue University.

A new automobile testing plant to be operated along lines similar to those of the locomotive testing plant has been installed at Purdue under the direction of W. F. M. Goss, Dean of the Engineering Schools. The mechanism is adapted to any type of automobile either steam, electric or gasoline and enables the power delivered and the efficiency to be found. A general view of the testing table and arrangement of dynamometer and brakes is shown in Fig. 1. From this it will be noted that the automobile is to be mounted for testing with its driving wheels carried by suporting rollers at one end of the table upon which the front wheels rest. The rollers are upon an axle which revolves in fixed bearings and the car is held in its position by attachment to a traction dynamometer which is shown in Fig. 2. A friction brake on the axle of the supporting rollers absorbs the energy delivered by the machine. A motor driv-

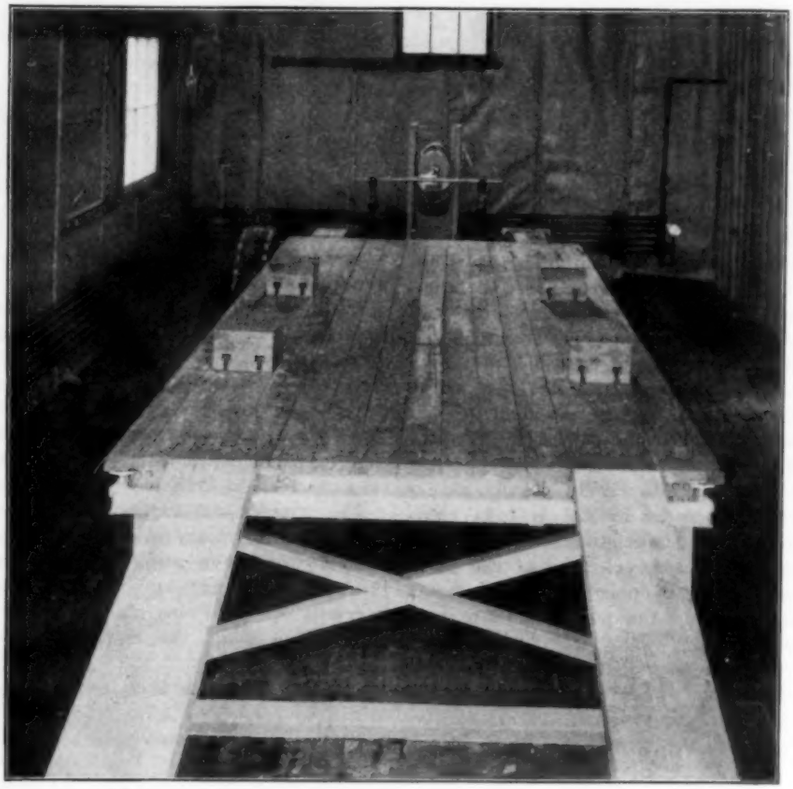


FIG. 1.—AUTOMOBILE TESTING PLANT, PURDUE UNIVERSITY.

en pressure blower delivers air through adjustable piping for cooling the radiators of steam and gasoline motors and an electrically driven exhauster takes air from a point near the exhaust of the machine, thus carrying off obnoxious gases from the laboratory.

The theory of the testing mechanism is evident from Figs. 2 and 3. If the friction rollers were clamped so that they could not turn, the automobile would, if started, tend to move ahead with its full tractive power even to the extent of slipping its wheels upon the rollers. Its forward pull under such condition would be registered upon the dynamometer. On the other hand if the rollers are frictionless, that is with the brakes relaxed, then the starting of the automobile would result in simply the rotation of the rollers without any pull being registered upon the dynamometer. By a combination of both these conditions the resistance against turning and the magnitude of the drawbar pull may be varied at will corresponding to conditions of heavy and light load.

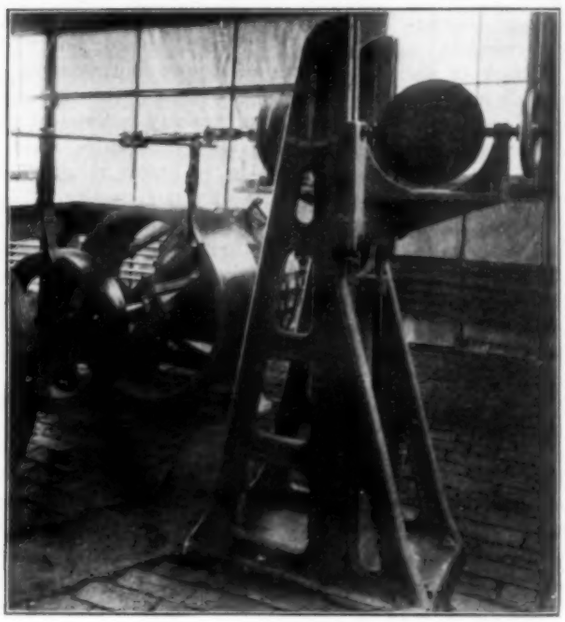


FIG. 2.—DYNAMOMETER.

In all cases the energy delivered by the automobile is the product of the pull exerted at the draw bar into the distance passed over by the tread of the driving wheel. While the plant is adapted to studies of a very exact nature it is not proposed to undertake during the present winter more than the determination of the output of power under various conditions of running of a considerable number of typical machines.

Wisconsin University.

The college of engineering of the University of Wisconsin has just announced the complete list of non-resident lecturers who are to address the students in engineering at the university during the present year. The lecturers selected include some of the most prominent authorities on special phases of engineering in the country.

F. B. Wheeler, engineer of the Semet-Solvay Co., Syracuse, N. Y., two lectures; subjects, gas engineering. G. M. Davidson, chemist for C. & N. W. Ry.; subject, purification of water for locomotive boilers. J. M. Faithorn, president of the Chicago Terminal Transfer Co.; subject, regulation of railroad freight rates. B. A. Behrend, chief engineer of Bullock Manufacturing Co.; subject, high speed in modern engineering. S. Wyer, consulting engineer, Columbus, O., two lectures; subjects, gas producers, and producer gas. L. R. Clauson, U. W. '97, signal engineer of C. M. & St. P. Ry. Co., subject, railroad signaling. Ralph Modjeski, consulting bridge engineer, Chicago; subject, the new Thebes bridge over the Mississippi near St. Louis. Arthur B. Wheeler, president of the Chicago Telephone Co.; subject, to be announced later. Professor L. P. Breckenridge, college of engineering, University of Illinois; subject, the use of bituminous coal in boiler furnaces. Andrews Allen, U. W. '91, construction engineer, Chicago; subject, engineering construction. Frank Skinner, assistant editor of *Engineering Record*, probably several lectures on bridge construction.

The highest velocity of underground waters recorded has just been discovered by H. C. Wolff, of the department of mathematics of the University of Wisconsin, in the course of an investigation which he carried on in Arizona during the Christmas recess. The rate of movement of underground water in gravels near Tucson he found to be 144 feet in twenty-four hours, while the highest previously rated by observers was only about 100 feet. Mr. Wolff was commissioned by the chief hydrographer of the United States geological survey to spend the Christmas holidays giving instructions to the members of the engineering department of the University of Arizona in the methods of measuring the rate of movement of under-flow steams. The University of Arizona is carrying on this work for the purpose of developing the water resources for irrigation in the neigborhood of the city of Tucson.

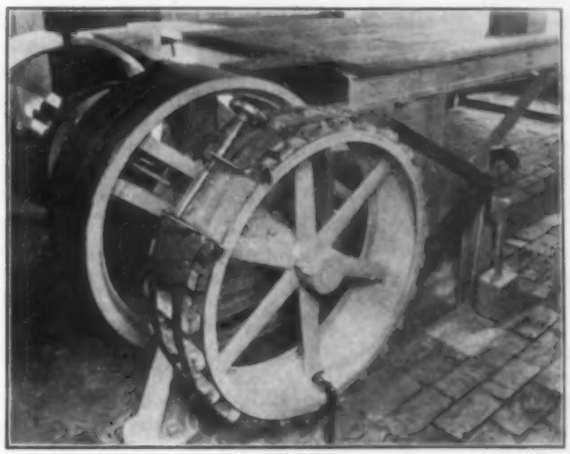


FIG 3.—FRICTION BRAKES FOR VARYING LOAD.

Carnegie Technical Schools.

The Carnegie Technical Schools have been the scene of unusual activity not only because of the business attendant upon the opening of its new departments but also in connection with various meetings of engineering associations that have been held there. Recently the Pittsburg chapter of the American Institute of Electrical Engineers held their second monthly meeting in the lecture hall when the subject of "Electric Railway Subdivisions" was discussed.

On Monday, Jan. 8, applications were received from those wishing to enter the Schools for Apprentices and Journeymen to the number of 500. The only requirement necessary for admission to this department is that the student must be employed at the trade in which he seeks instruction. The above number increased in the next few days to 2,109, all of whom were not eligible. Of the 1,364 who were, it was found possible to admit for this year only 200, but it is hoped that the limited teaching space will be rapidly enlarged, when the present restriction of numbers which is exceedingly re-

gretted by the faculty may be so far removed as to permit of more students being accommodated. A number of instructors have been appointed; among them Paul A. Young, assistant night instructor in mechanical drawing for the manufacturing trades, Frederick Ciffin, assistant night instructor in architectural drawing for the building trades, John F. Driscoll, assistant night instructor in plumbing, William M. Geist, assistant night instructor in machine shop and Hugh Calderwood, assistant night instructor in electrical wiring. All of these men have had large experience in practical work.

On Jan. 29 the following courses will be open: Machine work, pattern making, blacksmithing and forging, molding, plumbing, sheet metal and cornice work, electrical wiring, bricklaying and sign painting.

A collection of student drawings from a number of architectural schools throughout the country has been on exhibition at this institution in which the work done in many cities is represented. Among the contributing sources are the T-square Club of Philadelphia, Cornell University, George Washington University, Columbia University, St. Louis and Carnegie Technical Schools.

The Concrete Steel Co., with offices at 100 Broadway, New York, was recently incorporated with John F. Havemeyer, New York, president; A. J. Redway, Cincinnati, vice president; and Harry L. McGee, New York, secretary and treasurer. Until recently they held their respective positions with the Standard Concrete Steel Co. With them is associated as Chief Engineer H. C. Miller, M. Am. Soc. C. E., vice president of the newly organized Concrete Association and an engineer of wide experience in reinforced concrete work. He will have charge of the corps of engineers in New York, and a western office will also be maintained at Cincinnati under the direction of vice president Redway, with Albert Witte, who personally engineered the construction of the 14-story Ingalls building in Cincinnati, said to be the tallest concrete building in the country, in charge of the engineering force. The company is already erecting a large concrete hospital near Cincinnati. It will be in the market for concrete machinery and solicits communications from manufacturers in that line.

W. K. Kenley & Co., Chicago, dealers in relaying and light rolls have removed from the offices occupied by them in the Rookery Building to the suite 1630-32 First National Bank Building.

CANADIAN PROSPERITY.

In Iron and Steel Products for 1906 Insured by Railway Building.

(Special Correspondence.)

Toronto, Can., Jan. 22.—The announcements officially made by the representatives of the leading lines of railways in regard to railroad construction in the west during the present year, insures a continuance of the extraordinary demand for iron and steel products, which prevailed during 1905. The Canadian Pacific will build at least 250 miles of road comprising new branches and extensions of lines already under construction. The laying of double tracks at various points between Winnipeg and Fort William is now going forward, and it is anticipated that 100 miles of double track on this section will be available to move the crop of 1906. The Calgary and Edmonton branch, which now terminates at Strathcona, on the south bank of the Saskatchewan, will be carried into Edmonton by a high level bridge across the river, which with the two additional miles of track required, will involve an expenditure of $2,000,000. Contracts will shortly be let for the section of the Grand Trunk Pacific between the western end of the part now under contract and Edmonton, covering some 775 miles. The Canadian Northern Railway has nearly completed the branch from Dauphin to Prince Albert, about 260 miles long or 436 miles from Winnipeg. Its orders for railway equipment will total about $2,600,000 and include 44 locomotives, 1,000 box cars, 400 flat cars, 50 stock cars, 30 day passenger coaches, 16 baggage, mail and express cars, etc. All the locomotives and most of the cars will be made in Canada. The docks of the Canadian Northern Coal & Ore Co., at Port Arthur, with an area of 85 acres and a storage capacity of 500,000 tons, costing $1,000,000, will be completed by the opening of navigation, and the blast furnace is expected to be finished by August. The Grand Trunk railway has awarded a contract to the Westinghouse Electric & Manufacturing Co., for installing a system of electric traction in the St. Clair tunnel, on the alternating single-phase current system. The conductors will be placed on the walls in the interior of the tunnel and in the railway yards will be supported by steel bridges. The power will be developed by steam turbines. The trains will be hauled by alternating current locomotives capable of pulling a passenger train on the grade at the rate of 20 to 25 miles per hour, and a 1,000-ton freight train at 10 miles per hour. These undertakings together with other expenditures for construction and equipment previously announced, point to a season of great activity in all departments of the trade.

The Simonds Manufacturing Co., of Fitchburg, Mass., and Chicago, has taken over the business of the Canada Saw Co., which operates factories at Toronto, Montreal, Ottawa and St. John, N. B. These plants employ altogether about 150 men. It is understood that no immediate changes will be made, though it is probable that before long the business will be enlarged by the investment of additional capital.

R. J. Younge, of Toronto, secretary of the Canadian Manufacturers' associaton, is in Montreal arranging for special passenger rates in connection with the convention of the association to be held in Winnipeg in September next.

WORLD'S RAILWAY MILEAGE.

In a report just issued on "The Transportation Routes and Systems of the World," the Bureau of Statistics places the total railway mileage of the world in 1904 as 543,000 miles, divided as follows: United States 211,074; European Russia 35,323; Germany 32,967; France 28,102; India 26,950; Austria-Hungary 24,120; United Kingdom 22,634; Canada 19,611; Africa 15,560; Australia 14,113; Argentina 11,559; Mexico 10,356; Italy 9,961; Brazil 9,368; Sweden 7,697; Siberia 7,322; Japan 4,495; and China 1,176.

The rapid growth of railways in the United States has been remarkable. Beginning in 1835 with 1,000 miles, the trackage steadily increased, doubling in the decade 1865-75, and then advanced by leaps and bounds. The number of passengers handled in the year under review for the entire world was almost 720,000,000, and the freight tonnage aggregated 1,300,000,000.

The tonnage of vessels flying the United States flag has increased from 5,212,001 in 1855 to only 6,456,543 in 1905, and this was entirely due to the larger number of vessels engaged in the coastwise trade. During the same period the tonnage of United States vessels engaged in foreign trade fell off from 2,348,358 to only 943,750.

Frick on the Outlook.—Henry C. Frick in a recent Philadelphia interview said: "The business conditions of the country are unprecedented. There is general prosperity and there are no indications of any change in the situation. The iron business is at its best. The companies are working to their full capacity and orders are continuing to pile up. The future is very bright for the iron trade as well as for all other industries."

CART LOAD DELIVERIES

From Hour to Hour Employed to Meet British Iron Demand.

(Special Correspondence.)

Birmingham, Eng., Jan. 8.—The last meeting of Midland ironmasters on Thursday was marked by a cheerfulness to which of late years the Christmas season has been a stranger. Books are overflowing with orders, and there has been no suspension of buying. Pressure for deliveries has been enormous, and merchants and smelters have been swamped with telegrams, asking for small parcels of iron. In some cases, operations have only been continued by the sending of cartloads to meet hour to hour requirements. The contrast between the position a year ago is very striking, one furnace, for example, which at the end of last December delivered 100 tons, has this year sent out 600. Among the devices for securing increased deliveries are offers to "marry" contracts, smelters being asked to deliver under new contracts, with the object of increasing the total of their monthly accounts. For the most part, the invitations cannot be accepted. There is a good deal of anxiety as to future prices, and no doubt whatever is entertained that material advances will take place on or before quarterday. A number of users who have not bought for the last three months must then come on the market. Yet to everybody's surprise, Northamptonshire pig iron is at present selling at from £3 to £3 2s 6d. Some dealers who do not want orders are asking £3 5s, but even this will be accepted a few weeks hence.

In the Cleveland mining district the output has been larger during the past six months than for 24 years, and for raw material the various enlargements now in progress must create an additional demand. Thus in a few weeks the Cargo Fleet Iron Co. will have three 175-ton furnaces in operation. The South Durham Steel & Iron Co. is putting down two 200-ton similar furnaces at the Malleable Works, Stockton; and there are to be two more at Yarrow, at the works of Messrs. Palmer's Shipbuilding & Iron Co. The establishment of Dorman, Long & Co., Middlesborough, is consuming much more material for the reason that their Britannia Works, which, owing to labor troubles were closed most of last year, are now in full operation. On all hands there is news of extensions. Messrs. Baldwins, Ldt., who appear to be emulating the example of Guest, Keen & Nettlefold, by the absorption of steel works, have had added one more to their conquests, in the acquisition of the Port Talbot works for the manufacture of steel. Under these circumstances, the scarcity of material is a serious matter. Ferro-manganese is especially hard to get, and an addition of £2 10s per ton has just been made to the price. A notable fact in regard to the scarcity is the complete failure of German billet makers to fulfil their contracts, which is causing inconvenience to many users of this semi-raw material. A marked feature of the present revival is the entire disappearance in every form of the dumping which has been so long a source of irritation to the British manufacturer.

Ship building continues extraordinarily active, important American orders figuring in the list from the ports. Sir W. G. Armstrong, Whitworth & Co., have just secured the order from New York for a cargo steamer of 8,000 tons carrying capacity. The first installment of ship building returns show that Messrs. Doxford, of Sunderland, have secured the record of a year with 20 steamers and a total tonnage of 86,632; but Messrs. Harland & Wolff of Belfast run them very closely with 85,287 tons.

A curious circumstance is that this time of vigorous activity should have been chosen for the closing of Messrs. J. & S. Roberts' Swan Foundry, Swan Village. The whole of the men were paid off at the end of the year. Towards the close, the firm refused any number of orders, but their financial difficulties were quite insuperable.

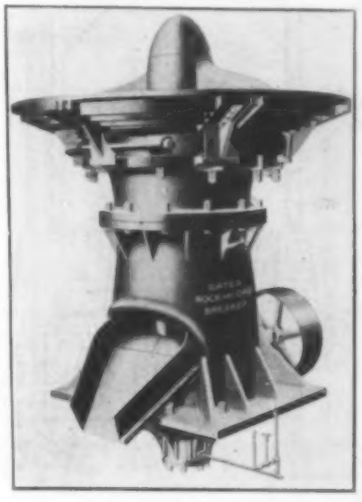
A New Foundry Supply Company.—Western Foundry Supply Co., is the name of a firm recently organized to manufacture ferro-manganese, ferro-silicon, chrome ore, foundry facing, etc. Its headquarters are at East St. Louis, Ill., where its plant is located on the Terminal Railway Co.'s tracks close to the L. & N. Junction. H. Nixon, of St. Louis, is president and J. A. Rogers, secretary and treasurer. J. J. Mallonee, of Savannah Ga., is a stockholder. A building 54 x 85 feet in dimensions and three stories high has been erected. The machinery will consist of a 100-horsepower boiler, 80-horsepower automatic engine, one crusher, one pulverized, rock emery mill, French burr mill, toggle screens, elevating machinery, bolting rolls, etc., all of which has been bought and is being installed. The plant is equipped for a daily output of one carload of foundry facing which will be made from Youghigheny gas coal, acknowledged to be the finest sea coal in the United States, which will be brought to St. Louis in barges down the Mississippi river. It will also have an output of one carload per day of ferro-manganese or ferro-silicon which will be granulated to pea size or powder, according to the requirements of customers. The company will also manufacture ground aluminum and at an early date contemplates placing on the market an alloy for use in gray iron foundries.

GATES CRUSHERS IN THE LAKE SUPERIOR IRON DISTRICT.

BY R. C. NEWHOUSE.

In 1870 England produced about three times as much iron and steel as the United States, while to-day the production in this country is nearly equal to that of England, Germany and France combined. This immense growth of the iron and steel industry in the United States is due principally to the rich deposits of ore found in the Lake Superior district, which annually contributes about eighty per cent of the iron ore mined in this country, and to the improved machinery used in the mining, transportation, handling and reduction of the ore. Of the many labor saving appliances used for handling the ore, the Gates gyratory rock and ore breaker holds a prominent place.

The five principal ranges of the Superior Iron District are: The Menominee and the Gogebic in Michigan and Wisconsin, the Marquette in northern Michigan, and the Mesabi and



GATES GYRATORY CRUSHER.

Vermillion in Minnesota. While some of the ores found in these ranges are soft and can be easily handled with pick and shovel, the rich ores, as a rule, are extremely hard and have to be blasted. In no respect is more clearly shown the exacting requirements of modern blast furnaces than in the demand for an ore broken to a certain size. It has been only a few years since the ore was shipped to the furnaces in miscellaneous sizes, and unusually large pieces were broken with a sledge: to-day the ore is passed through a crusher before being loaded into vessels and broken so that the greater part will pass through a three inch to a three and one half inch ring.

The selection of the proper size of crusher and the most suitable location can be determined only by a careful

study of all conditions at the particular place it is to be installed. The capacity of the larger sizes of Gates crushers, now largely used on the ore ranges, is so great that even a No. 7½ is generally large enough to handle the output of any one shaft. However, on account of the larger receiving opening, a No. 8 is commonly used where the crusher is placed at the shaft, and where the ore from several shafts is to be passed through one machine, the No. 9 is found most satisfactory.

While it is desirable to mount any heavy machinery on a solid masonry foundation, and crushers are generally so installed in a rock crushing plant, there are certain advantages in elevating the crusher where it is placed immediately above the shaft. The addition of a few feet to the lift makes little difference, where suitable machinery is already installed to hoist the ore from the mine, and by placing the crusher at a sufficient elevation above the ground, the material may be dumped into the crusher and run by gravity into the pocket and from that into the car. This does away with all further handling and with the use of elevators or conveyors. However, in some places a large centralized crushing plant is installed. This plant is generally placed at or near the ore loading docks, and the output of several mines brought to this one plant. In such a plant the crushers are placed far enough below the ground that the hopper cars discharge into them, and the crushed ore is elevated by means of belt conveyors or bucket elevators to a sufficient height to discharge again into the car which has just been unloaded into the crusher. This latter arrangement is entirely satisfactory for mines which do not operate during the winter months when navigation is closed, but for the mines running throughout the year, it

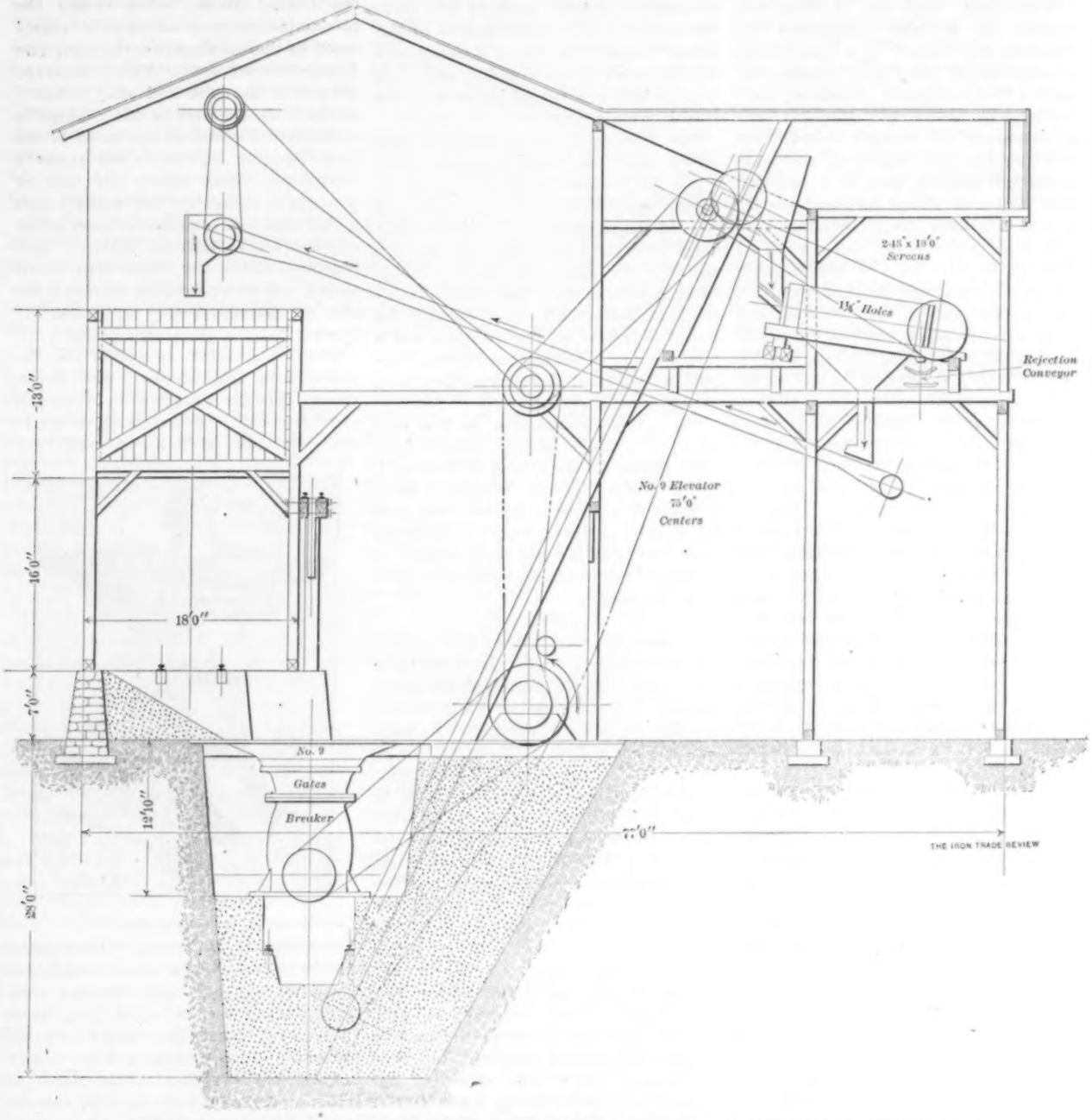


FIG. I.—GENERAL ARRANGEMENT OF CENTRALIZED CRUSHING PLANT. SECTION THROUGH NO. 9 CRUSHER HOUSE.

is desirable to have the crusher at the shaft, as the loading of the ore from the stock pile by means of steam shovels is more cheaply done when the material has been crushed to a uniform size.

The general arrangement of a centralized crushing plant for iron ore is shown by Figs. 1 and 2. Such a plant has a capacity of several thousand tons per day and is so arranged that all the material may be broken to pass through a one and one quarter inch ring. The equipment for this plant consists of one No. 9, five No. 5 and five No. 3 Gates crushers, together with the necessary elevators, screens and conveyors. Fig. 1 shows a section through the No. 9 crusher house, and Fig 2 shows a section through the No. 5 and No. 3 crusher house.

The ore is brought to the crushing plant in standard hopper bottom railroad cars, and dumped into the No. 9 crusher, where it is broken to about four inches. The material is then elevated and passed through two 48-inch x 10-foot revolving screens. All material smaller than one and one quarter inches is carried by a belt conveyor to the loading pocket, which is immediately above the unloading track. The rejections from the screens are carried by a second belt conveyor to storage bins above the No. 5 crushers (See fig. 2). For each No. 5 and No. 3 crusher there is provided one bucket elevator and one 40-inch x 10-foot revolving screen. The ore passing through No. 5 crushers is elevated and passed through the revolving screens, which are placed above the loading pocket. All material smaller than one and one quarter inches drops into the pocket, and the rejections are carried by chutes to the No. 3 crushers, recrushed and returned to the screens. With this arrangement, no material larger than one and one quarter inches can fall into the loading pocket. If a larger product is desirable the only change necessary is the substitution of screen sections with larger perforations.

In a plant such as described above, individual electric motors furnish the most satisfactory drive. In case the plant is not operated to its full capacity a part of the machinery may be stopped without in any way interfering with the successful operation of the balance, and by the use of separate motors, all long driving belts and complicated shafting are eliminated. The saving of power with such an arrangement is an important consideration, but it is of still greater advantage to be able to throw out any one machine in case of accident. Even where the crusher is placed at the head of the shaft, and only one machine is installed, the use of electricity is a decided advantage. At most ore crushing plants skilled labor is not used, as the crushing machinery is designed for severe service, and therefore many operators prefer to use plain slide valve engines, even with a considerable loss of efficiency, rather than install more complicated engines.

Where electric motors are used, no skilled labor need be in attendance at the crushing plant and the current may be generated at the central power plant, which is always in charge of competent engineers.

A recent improvement in Gates crushers is the style "K" which has a suspended shaft. The first crushers of this type were constructed with a step bearing to support the main shaft, to which is attached the crushing head. While this style of construction is satis-

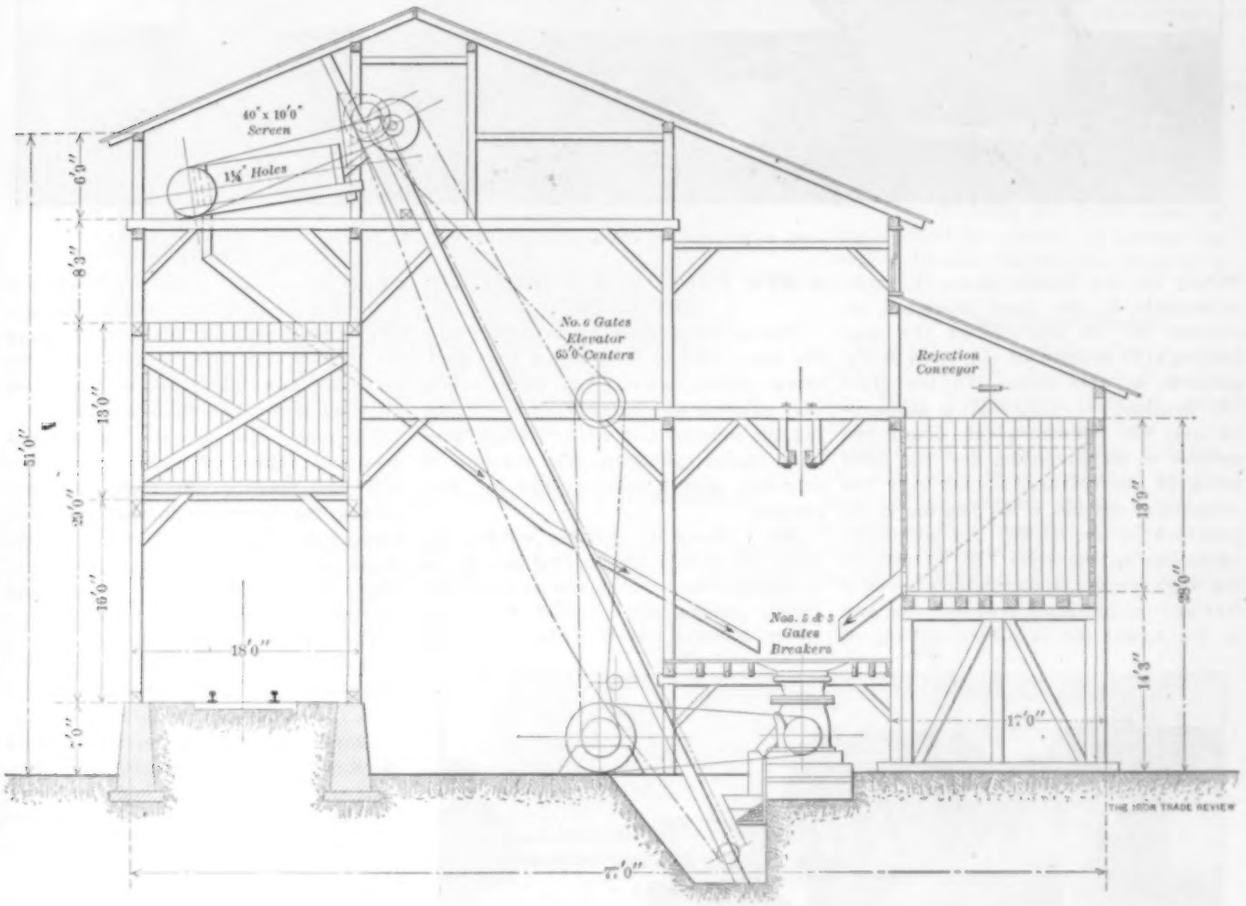


FIG. 2.—GENERAL ARRANGEMENT OF CENTRALIZED CRUSHING PLANT. SECTION THROUGH NO. 3 AND 5 CRUSHER HOUSE.

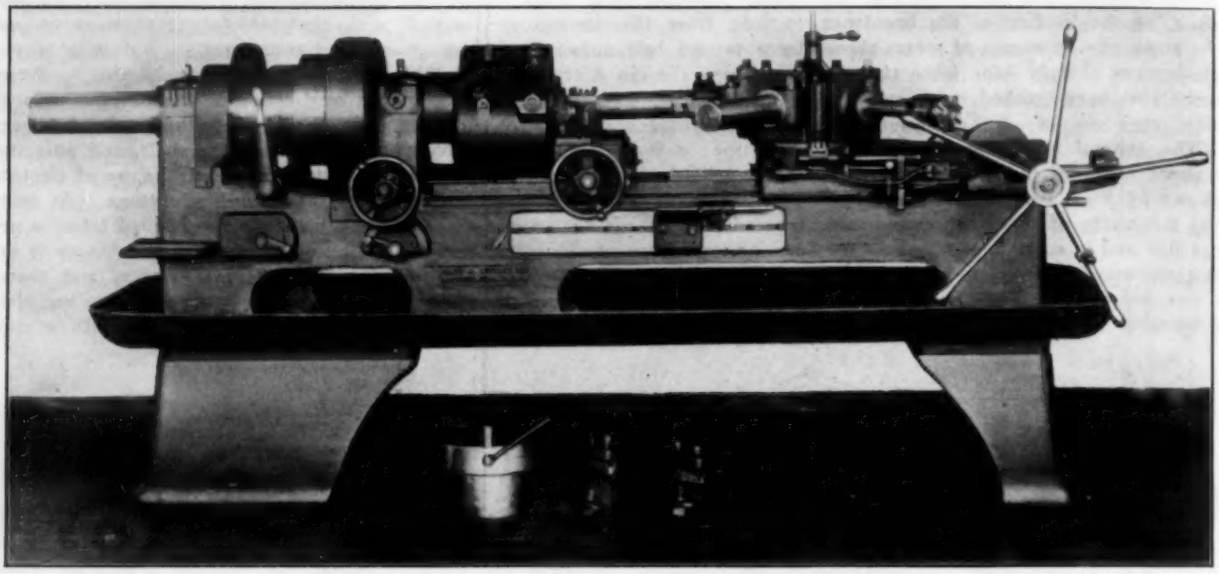


FIG. 1.—3 x 36-INCH PRATT & WHITNEY TURRET LATHE.

factory for the smaller sizes, it is objectionable in the large machines on account of the friction on the step bearing, the motion of the shaft being greatest, at this point. In the style "K" breaker, the main shaft is suspended near the fulcrum point, where the motion is inappreciable, and the joint being of the ball and socket type the suspension nut has a full bearing in all positions of the shaft. An additional advantage in the style "K" breaker is the high arched spider which gives a free and unobstructed feed opening, and as the spider rim is placed outside of the shell and the hopper brought down to a point immediately above the concave wearing surfaces, the strength of the shell is considerably increased, without introducing additional weight, and the height of the machine materially reduced.

A NEW PRATT & WHITNEY TURRET LATHE.

The accompanying illustrations show the new Pratt & Whitney 3 x 36 inch turret lathe, which has been found very efficient and satisfactory for finishing the interior and ends of small gasoline engine cylinders. The machine is provided with a special head for this purpose.

Fig. 1 shows the machine without the usual rod feeding and holding device. It is, instead, fitted with a special chuck for rigidly holding the cylinder and with turret and cross slide tools for boring the inside of the cylinder and for turning and facing a collar at one end. The work is gripped by means of two swinging clamps on the chuck. Each clamp operates against two fixed points, and also has two boring pins and a swinging member. The work, consequently, is supported on eight separate points while it is being machined. This avoids the necessity of clamping so tightly as to distort the casting, and also insures that the bore and the cylinder will be true when the work is removed from the chuck.

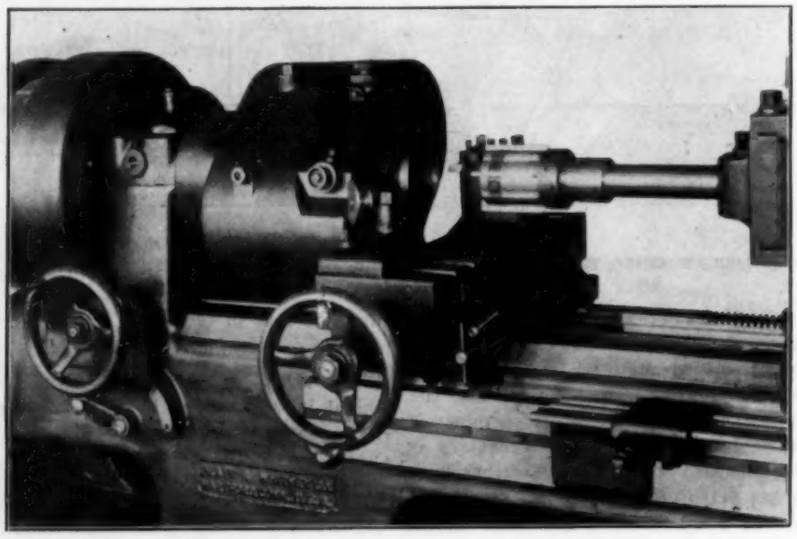


FIG. 2.—SPECIAL HEAD ON PRATT & WHITNEY TURRET LATHE.

The turret tools are for boring cylinders and consist of rigid boring bars with high speed cutting tools. An arm holding the cutter for turning the collar heretofore referred to, is fitted on the shank of one of the bars, and is clearly shown in the illustration. No detailed explanation of this feature is necessary.

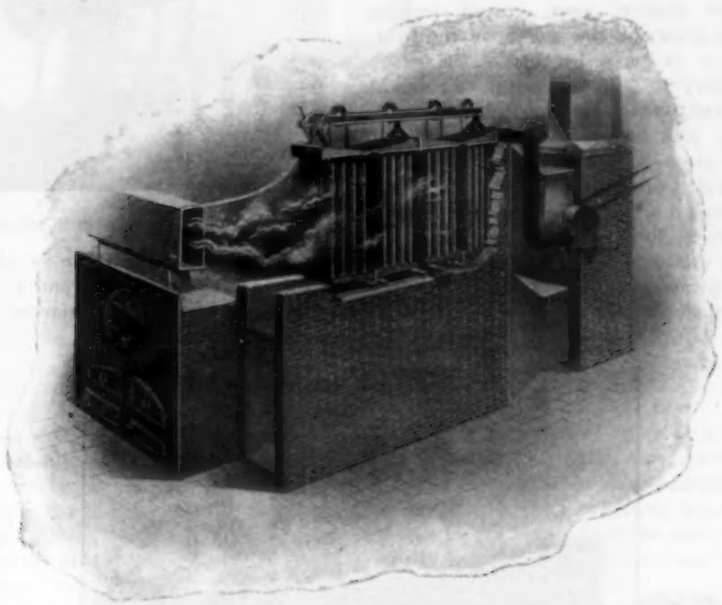
The reamer for finishing the hole is allowed to float on its shank, and is of the expansion type. The illustrations of the cross slide tools also are self-explanatory. It may be noted, however, that as both the turret slide and the cross slide have independent power feeds, both the boring and the cross slide tools have simultaneous action and effect considerable economy in time. The cylinder shown in the illustration has a diameter of 4 inches, and is 7 inches deep.

This lathe is particularly applicable to automobile manufacture. A large number are in use on this work and are giving excellent satisfaction. Where there is insufficient work to keep the machine constantly at work on castings, it is advisable to have it equipped with a rod feed and collet mechanism. This would permit rod work to be handled as well as the castings.

The Detroit Steel Pulley Co., Detroit, has completed enough building to meet its requirements for the winter and expects to have its product, a sheet steel pulley for the transmission of power by belting, on the market by April 1. Practically all the machinery required is of special design and has been purchased.

THE GREEN AIR HEATER.

The Green Fuel Economizer Co., Matteawan, N. Y., has recently developed an air heater which is similar in many respects to the well known Green economizer. The air heater is installed in a manner similar to the economizer, in the waste gas passage of the boiler.



INSTALLATION COMPRISING GREEN AIR HEATER AND GREEN FUEL ECONOMIZER.

Air is drawn in at the top by means of a fan and forced first down through one set of tubes, up through another set, then down, and so on until it leaves the heater to be distributed by pipes to drying chambers, and other places in which the heated air is used.

The tubes are of cast iron and are nine feet long between the headers and have an internal diameter of 3⅞ inches. They are hydraulically pressed into top and bottom boxes which are of sloping design, in order to insure uniform velocity and distribution of the air in passing from one set of tubes to the next. The air moves through the tubes at a high rate of speed, and by the frequent redistribution to the tubes all possibility of short-circuiting or eddying is eliminated. This results in a high efficiency of the heating surface. Separate top and bottom boxes are provided for each row of tubes, so that any number of rows may be set up together for any capacity of plant or any amount of air required. If it is desired to prolong the time that the air is in the heater in order to bring its temperature nearer to that of the flue gases from which it receives its heat, any number of groups may be connected up in series.

The cold air from the blower enters the heater at the end where the flue gases pass into the chimney, while the heated air is taken out at the end nearest the boiler, where the flue gases are at their highest temperature. This causes a uniform difference of temperature to be maintained between the flue gases and the air in the tubes. The air heater may be combined with the economizer and a test made on a plant of this kind, which contained 144 economizer tubes and 72 heater tubes, gave the following results:

Temperature of gases entering economizer	400	Degrees F.
Temperature of gases entering air heater	301	" "
Temperature of gases leaving air heater	257	" "
Temperature of water entering economizer	112	" "
Temperature of water leaving economizer	248	" "
Temperature of air entering air heater	70	" "
Temperature of air leaving air heater	152	" "

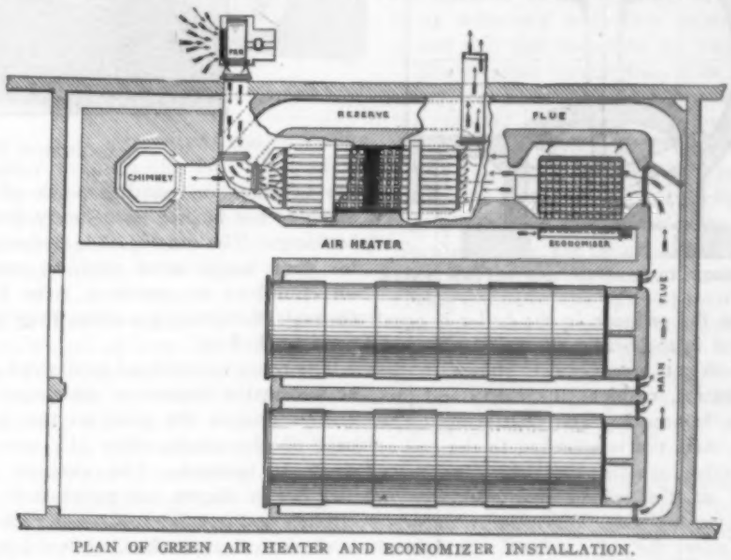
It will be noted that the air left the heater at the temperature of 152 degrees F. Air at this temperature will take up nearly 0.01 pound of water per cubic foot, making it very effective for drying purposes. In a test made upon a heater containing 240 pipes, the following results were obtained:

Duration of test	8 hours
Cubic feet of air entering fan per minute at 54 degrees F	4616
Rise of temperature of air	147.6 Deg. F.
Temperature of boiler flue gases entering heater	513 " "
Temperature of boiler flue gases leaving heater	8.9 " "
Coal used in 8 hours	51¼ cwt. = 12.02 pounds per minute.
Air pressure at inlet to heater	2 inches water
" " " outlet from heater	1 inch "
Area of inlet pipe to heater	330 square inches
Combined area of outlet from heater	344 " "
Average speed of a 54-inch diam. steel plate fan in revolutions per minute	633

This heater will replace steam heater coils for drying, thereby saving as much steam as will be required for drying and the corresponding amount of fuel, also relieving the boiler plant of this demand for steam. It thereby increases, by this amount, the capacity of the plant.

New Machinery Needed.

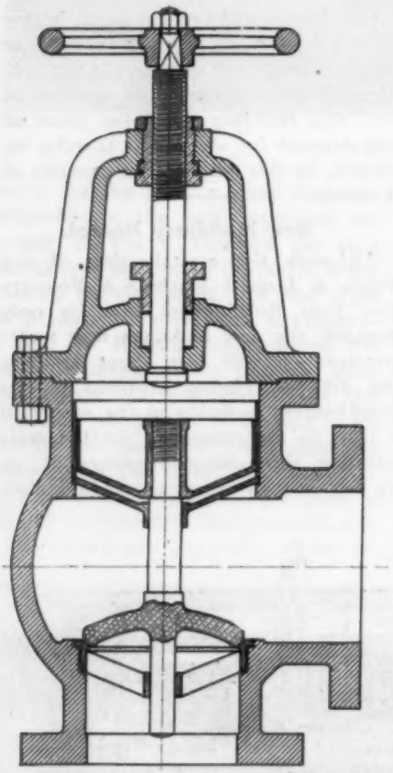
Although the capitalization of the Payne & Joubert Machine & Foundry Co., East Birmingham, Ala., is only $100,000, the new buildings now under construction will cost about $150,000, the difference being provided by the stockholders probably in the nature of a loan to the company. In the main building three electric cranes of 25, 15, and 10 tons capacity, will be installed. Two cupolas will have a total melting capacity of about 75 tons per day. Contracts have been closed for this equipment, but the electrical machinery, generators, motors, etc., as well as a part of the necessary machine tools have not yet been ordered. Sugar apparatus will be the chief output, though other lines will be developed with the intention of doubling the size of the plant within two years.



PLAN OF GREEN AIR HEATER AND ECONOMIZER INSTALLATION.

ANDERSON CUSHIONED NON-RETURN VALVE.

The Anderson cushioned non-return valve is designed to act as a safeguard in emergencies, such as the bursting of a tube or other accident. The sectional view herewith, gives a good idea of the general character of this valve, of which there are three types; the cushioned non-return, combination cushioned non-return and triple-acting non-return, designed for all pressures of steam. The valve when placed between the boiler and the header to equalize the pressure between the units of a battery of boilers remains closed as long as the boiler pressure is lower than that of the header.



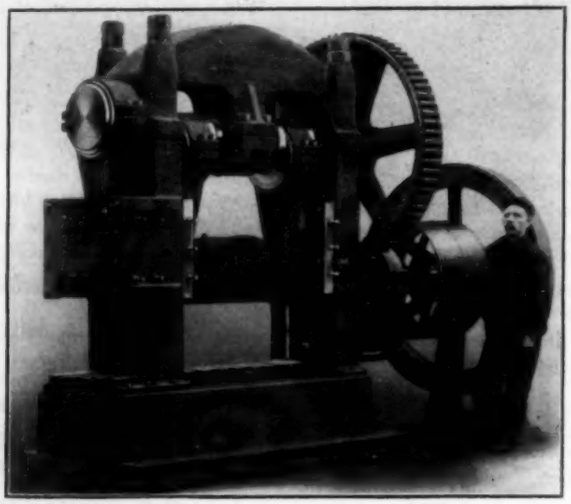
ANDERSON CUSHIONED NON-RETURN VALVE.

When the pressure in the boiler is equal to that in the header the valve will open. A dash-pot arrangement, shown in the illustration, cushions the valves and prevents hammering and chattering. The inner dash-pot is attached to the end of the valve spindle, the outer one being loose on the spindle and also free to move on the body. When the steam pressure raises the valve a cushion is formed in the resulting space between the dash-pots. In the combination cushioned non-return valve, a small auxiliary hand-wheel is provided, which may be raised and, the valve held open as long as desired. The triple-acting valve combines the features of a non-return valve, an automatic emergency stop valve and a hand stop valve. This type is especially designed to act as a safe-guard in emergencies, as the bursting of tubes, fittings or pipes and is also good as a safety stop to prevent steam being turned into a cold boiler when men are working inside. These valves are made by the Golden-Anderson Valve Specialty Co., of Pittsburg, Pa.

GARRISON DOUBLE CRANK GEARED FORGING PRESS.

The double crank geared forging press shown in the accompanying illustration is built by the A. Garrison Foundry Co., of Pittsburg, Pa., and is adapted to the manufacture of hammers, axes, pick axes, mattocks, hoes, etc. The piece to be forged is finished in several operations, passing along through a series of dies set side by side.

The machine will forge a blade on a steel mattock in one heat. The slides and pitmans as well as the die shoes are made of steel castings, while all of the bearings or wearing parts of the machine are bushed with heavy bronze bushings. The outside slide is designed for very heavy work such as cutting off cold bars or punching large holes through the forgings after they have been worked up.



GARRISON DOUBLE CRANK PRESS.

The press is arranged as desired with an automatic friction or pin clutch and always returns the slide to the upper part of the stroke after the required work is finished. The average iron pick eye is shaped and punched in two strokes and a solid tool steel pick eye in three or four strokes, while a hatchet eye may be made in two or three. The capacity of the machine is from 1,000 to 2,000 iron picks or hatchet eyes per day or from 500 to 1,000 steel pick eyes, depending upon the size and style of the eye. The structure of the press is held together and made rigid by four large tie rods which pass down through the arched housings and bed making it almost impossible to break any part by stalling the machine.

THE NORCROSS MOLDING MACHINE.

A new and very simple molding machine has been developed by the Norcross Molding Machine Co., of Terre Haute, Ind. This machine is shown in two positions in Figs. 1 and 2. The machine consists of a substantial base upon which is placed a column containing a cylinder in which a piston, carrying the entire upper portion of the molding machine, is fitted.

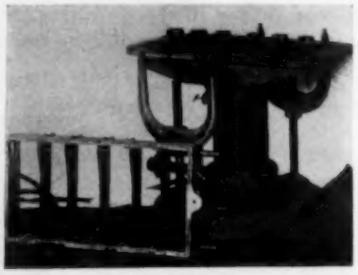
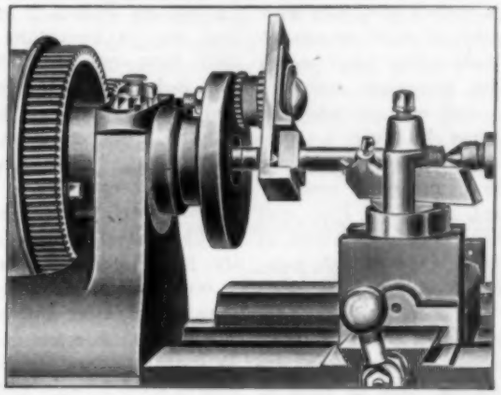


FIG. 1—PATTERNS READY FOR MOLDING

In Fig. 1 the machine is shown ready to receive the flask, which is placed about the patterns and filled with sand. Air is then turned on by means of a valve connected with the supply hose

FIG. 2—PATTERNS STRIPPED.

or pipe. The parts are so constructed that as soon as the air is turned on, the entire upper part of the machine, including the pattern plate, stripping plate, flask and sand, are raised and allowed to fall in such a way as to cause a rapid succession of blows of the lower end of the piston upon the



ARMSTRONG BOLT DRIVER IN USE.

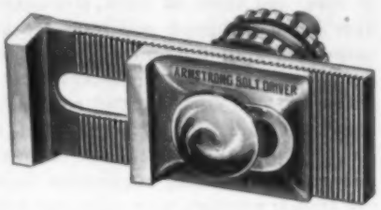
base plate. This jars or rams the sand thoroughly. The mold is then struck off; the air turned on in such a way as to raise the table, when the table is given a rotation of 90 degrees and the air allowed to exhaust. As the air exhausts, the piston descends, taking with it the pattern plate; but the stripping plate with flask are kept upon suitable supports as shown in Fig. 2, and the patterns are thus stripped through the plate. The flask is then removed; the air once more turned on to raise the parts free of the supports, when the machine is given a ¼ turn and dropped into position shown in Fig. 1, ready to receive the flask for the next mold.

The parts are so constructed that the piston forms its own valve, and as there are no other working parts, there is nothing to get out of order or to be clogged with sand; in fact the machine is made as simple as it was possible to design it.

The Firth-Sterling Steel Co., McKeesport, Pa., declares Eben B. Clark, treasurer and general manager, has bought more ground near Washington, D. C., than will be required for its new plant. Talk of a five million dollar plant he declares a gross exaggeration, adding "if this sum is divided by ten it will be nearer the truth." The projectile department will be removed to the new site, the space vacated at the McKeesport plant being devoted to additions for the tool steel department. It is planned to have the work of building well under way by summer, and by winter to have at least a part of the works in operation.

THE ARMSTRONG BOLT DRIVER.

The Armstrong Brothers Tool Co., 104 North Francisco Ave., Chicago, has recently placed on the market a bolt driver which is shown in the accompanying illustrations. It is an extremely handy and useful device for use in turning and threading bolts in a lathe. Its construction and operation are shown clearly in the illustrations, and further description is hardly necessary. The driver is made in three sizes, varying in capacity from two to four inches



THE ARMSTRONG BOLT DRIVER.

each. By means of the extension washer between the face plate of the lathe and the driver body, the position of the driver can be adapted to centers of varying lengths. It can be used on square, flat or hexagon stock.

The Vandyke Churchill Co., machine tool dealers of New York, New Haven and Philadelphia, has opened a branch office in the Farmers' Bank building, Pittsburg. Among the lines carried will be those of the American Tool Works Co., Cincinnati, consisting of 14-inch to 60-inch lathes of all types, radial drills from 2½ to 7 feet, upright drills and shapers of all sizes, metal planers from 22 to 26 inches and the Higley cold metal sawing grinding machines. The office will be in charge of a well known machine and tool man of Pittsburg.

Iron ore imports for December are placed at 104,244 tons, largely for Pittsburg account. The manganese item was heavy.

NEW GERMAN TARIFF RATES ON MACHINE TOOLS.

Unless something is done by our government to secure for the manufacturers of this country the import rates accorded the favored nations the duty upon American machine tools entering Germany will on March 1 be increased by from $ .23 to $1.91 per 100 kilos (220.4 pounds). It appears that the German authorities are awaiting action on the part of this country to begin negotiations for reciprocal relations, but prospects for action on this side of the Atlantic are not bright.

United States Consul-General Mason at Berlin has submitted a report on the German tariff situation accompanied by a copy of the new "Treaty Tariff" which is now on file in Washington at the Department of Commerce. The report contains a table which shows that the duties on machine tools under the new tariff law of 1902 to go into effect during the present year are per 100 kilos as follows: a. 250 kilograms (551 pounds or less), autonomous $4.76, as reduced by treaty $2.85, difference $1.91; b. 250 to 1,000 kilograms (551 to 2,205 pounds), autonomous $2.85, reduced by treaty $1.90, difference $.95; c. 1,000 to 3,000 kilograms (2,205 to 6,614 pounds), autonomous $1.90, reduced by treaty $1.42, difference $.48; d. 3,000 to 10,000 kilograms (6,614 to 22,046 pounds), autonomous $1.42, reduced by treaty $1.19, difference $.23; over 10,000 kilograms $.97 not reducible by treaty.

The German authorities, it is understood, have submitted proposals looking toward reciprocal relations with this country, involving a modification of our customs regulations, but the chance of such modification seems very small. Two of the points upon which Germany lays the most stress are, a modification of the present system of taxing goods on the basis of their home valuation and the introduction of some change in the present system of additional duties under which goods are given one per cent of additional duty for every per cent of undervaluation.

Germany has concluded commercial treaties with Russia, Austro-Hungary, Italy, Switzerland, Belgium, Roumania and Servia. In consequence of these treaties the German Government on Nov. 29 officially denounced through its embassy at Washington, the agreement of July 10, 1900, drawn under section 3 of the Dingley act, which regulates the admission of certain products to the United States in return for minimum tariff rates on American products.

ADDITIONS TO EXISTING ROLLING MILLS AND STEEL WORKS.

The following is a list compiled by the American Iron and Steel Association of important additions that have been made or are being made to some rolling mills and steel works that are described in the last edition of the directory of the Association of August, 1904:

Massachusetts Steel Casting Co., Everett, Mass. Works at West Everett. One 2-gross ton Tropenas converter added to an open-hearth and crucible steel casting plant in 1904 and first blow made December 29, 1904; product, steel castings; annual capacity 3,250 tons. Also makes open-hearth and crucible steel castings.—Crucible and open-hearth furnaces formerly operated by the United States Steel Company.

New Jersey Steel Co., Rahway, New Jersey. One 20-gross-ton acid open-hearth steel furnace added to an Evans-Wills steel casting plant in 1905; not put in operation down to December 1, 1905; product, steel castings; annual capacity, 9,000 tons of open-hearth and 5,000 tons of Evans-Wills steel castings.

Duquesne Steel Foundry Co., Pittsburg. Works at Kendall Station, P. & L. E. R. R., (post-office address of works, Coraopolis,) Pa. One 14-inch train of rolls and one large double heating furnace added to an open-hearth steel casting plant in May, 1905, and first wheels rolled in that month; product, rolled steel car wheels; annual capacity 5,000 tons of wheels and 10,000 tons of open-hearth castings.

Johnson Forge Co., Wilmington, Del. Built in 1889; destroyed by fire in October, 1903; rebuilt in 1904; 7 puddling and 4 heating furnaces and 5 trains of rolls (one 3-high 21-inch muck and one 3-high 9-inch, two 3-high 12-in. and one 3-high 20-inch bar); product, merchant bar iron; annual capacity, 20,000 tons. Fuel, coal.—Plant recently sold by order of court to John R. Johnson; idle since 1903.

Southern (The) Steel Works, 610-14 Royce street, Chattanooga, Tenn. One 2-gross-ton Tropenas steel converter added to a steel plant in 1904; first Tropenas steel made December 1, 1904; product, tool steel, steel castings, etc.; annual capacity, 1,500 tons of Tropenas and 300 tons of crucible steel. (One 3-gross-ton acid open-hearth steel furnace dismantled in 1904.)

Atlanta Steel Hoop Company, Atlanta, Georgia. Proposes adding to its present equipment two stationary 35-gross ton basic open-hearth steel furnaces with an annual capacity of from 20,000 to 25,000 tons of ingots; one 25-inch blooming mill with an annual capacity of 30,000 tons of 1½-inch to 4-inch billets; one rod mill, with 6 stands of continuous and 6 stands of Belgian rolls, with an annual capacity of from 10,000 to 15,000 tons of wire rods and 10,000 tons of material for hoops, rounds, etc.; 14 wire-drawing blocks with an annual capacity of 7,000 tons of wire; and 36 wire-nail machines with an annual capacity of from 50,000 to 100,000 kegs of nails.—The open-hearth furnaces and the blooming mill are now being built and will probably be ready for operation by July 1, 1906. Installation of the other machinery will probably be commenced soon.

Bessemer Plant, Republic Iron and Steel Co., Chicago, Illinois. Works at Youngstown, Ohio. One 28-inch combination rail and sheet bar mill, with one 3-high and one 2-high stands, added to a Bessemer steel plant in 1905; first steel rail rolled April 22, 1905; annual capacity, 600,000 tons of rails or sheet and tinplate bars.

Struthers Plant, Morgan Spring Co., Worcester, Mass. Works at Struthers Ohio. Originally built by the Youngstown Manufacturing Company in 1902 for the manufacture of bolts, nuts, and rivets; one 10-inch train of rolls added in 1903; purchased by present owners in 1905 and train of rolls dismantled; now being equipped with one Morgan suspended roof continuous billet heating furnace, 2 gas producers, and 2 trains of rolls (one 6-stand continuous roughing train having 2 stands of 12-inch and 4 stands of 10-inch rolls and one 10-inch 10-stand continuous finishing train); product, wire rods and bolts, annual capacity, 85,000 tons of wire rods and 12,000 tons of bolts. Fuel, coal and manufactured gas.—Will probably be ready for work in February, 1906.

Youngstown (The) Sheet and Tube Co., (formerly called The Youngstown Iron Sheet and Tube Company,) of Youngstown, Ohio. Now adding to its works at Youngstown two 10-gross-ton acid Bessemer steel converters with an annual capacity of 360,000 tons of ingots; also 4 cupolas, four 4-hole soaking pits, one 40-inch blooming mill, one 18-inch continuous billet mill, one 18-inch continuous sheet bar mill, one 10-inch continuous skelp and hoop mill, and one 2-high 42-inch universal mill; product, blooms, slabs, billets, sheet bars, skelp, hoops, and universal plates; when additions are completed the works will have an annual capacity of 360,000 tons of blooms, slabs, billets, and sheet bars, 30,000 tons of muck and scrap bar, 30,000 tons of black sheets, 24,000 tons of galvanized sheets, 12,000 tons of painted and corrugated roofing, 72,000 tons of universal plates, 150,000 tons of skelp, and 141,000 tons of black and galvanized pipe. The company now makes wrought iron and steel pipe from ⅜ of an inch to 12 inches in diameter.—Additions will probably be completed in July, 1906.

Detroit (The) Steel Casting Co., Detroit, Mich. Built in 1889; destroyed by fire on February 19, 1905; rebuilt and put in operation September 30, 1905; now equipped with two 1½-gross ton Robert-Bessemer steel converters and one cupola; first blow made July 11, 1889; one 20-gross-ton basic stationary open-hearth steel furnace and 2 gas producers added in 1905; first open-hearth steel made October 23, 1905; product, steel castings; annual capacity, 5,000 tons of Robert-Bessemer and 15,000 tons of open-hearth steel castings. Fuel, coke and oil.

National Electric Co., Milwaukee, Wisconsin. One 5-gross-ton acid open hearth steel furnace added to a crucible steel casting plant in 1904; first open-hearth steel made August 1, 1904; product, steel castings; annual capacity. 3,000 tons of open-hearth and 800 tons of crucible steel castings. Fuel, oil.

Rolling Mills to be Dismantled Soon.

Atlantic Works, Republic Iron and Steel Co., Chicago. Works at New Castle, Pa. Established in 1838; product, merchant bar iron and skelp iron; annual capacity, 18,000 tons.—To be dismantled in 1906.

Alexandria Works, Republic Iron & Steel Co., Chicago. Works at Alexandria, Indiana. Established in 1893-5; put in operation in July, 1895; product, muck and bar iron; annual capacity, 40,000 tons.—To be dismantled in 1906.

HILL'S NOTE OF WARNING.

In an address before the Commercial Club of St. Paul last week James J. Hill, president of the Great Northern Railway Co. and heavily interested in the ore fields of the northwest, pointed out a danger of present industrial conditions. "When the nation at large is prosperous," he said, "we are cutting a wide swath, there is no doubt of that. If we get down, however, to a closer examination, we will readily see that the nation is living profligately. We are selling out our natural resources, exploiting them as fast as we can, without building up trade relations to take their place when exhausted. It is only a question of time till our timber is exhausted. Our public domain is all gone, and the nation cannot longer boast that it has homes for all. . . . We will eventually have to meet the commercial competition England is meeting today, and have to face such problems as she is facing with 1,500,000 unemployed crying for bread."

Steel Securities Set New High Records.

The preferred stock of the United States Steel Corporation during the past week sold at the highest price in its history; the common stock reached the highest mark since 1902. Both were actively dealt in and were market leaders. Colorado Fuel & Iron also reached a new level. Practically all the other iron, steel and manufacturing securities were the basis of active trading; all held their own and a majority recorded decided advances. The week on the stock exchanges was one of pronounced strength and activity, almost without a disquieting feature. Money rates were nominal, due largely to the release of heavy amounts of dividends, foreign disorders were at a minimum and reports from every line of commercial and industrial life were exceedingly favorable in tone. The advance movement began early in the week and continued steadily, with the only severe break when a drop of three-fourths cent per pound in the price of all grades of copper caused a temporary panic among the manipulators of Amalgamated Copper, which, however, recovered promptly enough to send the total sales of the week in that line to well over 1,100,000 shares. The steel securities and Colorado Fuel & Iron were the pronounced features in the iron and steel stock market. Steel common sold an aggregate of 454,700 shares, with a net advance of a point and a half; steel preferred totaled sales of 214,600 shares and gained four and three-fourths points; Colorado Fuel & Iron sales were 345,000 and a net advance of 12 points was made, the new price being the highest ever quoted. The effect of the publication in a number of railway reports of the heaviest earnings in history was noticeable in the brisk trading in American Locomotive, American Car & Foundry, Pressed Steel Car and Railway Steel Springs, all of which contributed materially to the daily average dealing of 1,500,000 shares on the New York exchange and reflected the general upward tendency. Crucible Steel issues were firm and higher. The week witnessed much profit-taking, but this was in the face of such active dealing and with such favorable conditions that any downward influence it might have exerted was more than overcome.

Financial Notes.

Recent dividend declarations include the following: Bethlehem Steel Corporation, regular quarterly preferred, 1¾ per cent, payable Feb. 1; Cambria Steel Co., regular semi-annual, 1½ per cent, payable Feb. 15; Consolidated Car Heating Co., regular semi-annual, 1½ per cent, payable Feb. 1; Pullman Co., regular quarterly, $2 per share, payable Feb. 15.

Stockholders of the Tennessee Coal, Iron & Railroad Co., will meet Jan. 31 to vote upon the proposition to issue $7,000,000 additional stock, raising the total to $30,000,000. The proceeds of the sale will be devoted to enormous developments of its properties.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quotation Jan. 13	Closing Quo. Jan. 20	Changes	Date of 1906 Ann. Meet.	Par Value	Capital Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div. Dec.
Allis-Chalmers Co	23½	23¼	+ ⅜	Sept.	100	19,820,000		.....	....
Allis-Chalmers preferred	63¾	63⅜	− ⅜		100	16,150,000	7 cum	.....	Feb., 1904
AmericanCan	10¼	12	+1¾	Apr. 24	100	41,233,300			....
AmericanCan preferred	70¼	70¾	+ ½		100	41,233,300	7 cum	5 Q.	Jan., 1906
AmericanCar and Foundry	43⅜	45¼	+1⅞	June 28	100	30,000,000		.....	May, 1905
AmericanCar and Foundry preferred	100⅜	103	+2⅝		100	30,000,000	7 n. c.	7 Q.	Jan., 1906
AmericanLocomotive	76¾	76¾	+ ⅜	Oct. 16	100	25,000,000		.....	
AmericanLocomotive preferred	119⅝	119¼	− ⅜		100	24,100,000	7 cum	7 Q.	Jan., 1906
American Shipbuilding	56	56½	+ ½	Oct. 2	100	7,600,000	4	4 Q.	Dec., 1905
American Shipbuilding preferred	104	104½	+ ½		100	7,900,000	7 n. c.	7 Q.	Jan., 1906
American Steel Foundries	14⅝	14¾	+ ⅛	Oct. 3	100	17,700,000		.....	
American Steel Foundries preferred	50⅞	52	+1⅛		100	17,700,000	6 cum	.....	Aug., 1905
Barney & Smith	17	20	+3	June 5	100	1,000,000		.....	June, 1894
Barney & Smith preferred	123	123	.....		100	2,500,000	8 cum	8 Q.	Dec., 1903
Bethlehem Steel	31¾	34	+2¾	April 3	100	15,000,000		.....	
Bethlehem Steel preferred	90½	93	+2½		100	15,000,000	7 n. c.	7 Q.	Feb., 1906
Bullock Electric preferred	114	114	.....	Oct. 2	100	1,000,000	6	6 Q.	Jan., 1906
Cambria Steel	34½	35	+ ⅝	March 20	50	45,000,000	6	3 S. A.	Feb., 1906
Cambria Iron	49	49¼	+ ¼		50	8,468,000	4	4 S. A.	Jan., 1906
Colorado Fuel & Iron	60⅞	72¾	+11⅞	Oct. 15	100	30,132,000	7	.....	Apr., 1902
Wm. Cramp & Sons Ship & Eng. Bldg. Co.	27	28	+1	May 31	100	6,098,000	5	.....	Nov., 1902
Crucible Steel	14¾	16⅜	+1⅝	Oct. 17	100	25,000,000		.....	
Crucible Steel preferred	78¼	80	+1¾		100	25,000,000	7 cum	.....	Sept. 1903
Empire Steel	6	6	.....	Feb. 28	100	2,281,400		.....	
Empire Steel preferred	38	37	−1		100	2,500,000	6 cum	3 S. A.	Jan., 1905
Fay & Egan	95	95	.....	Feb. 20	100	1,000,000	5	5 Q.	Nov., 1905
Fay & Egan preferred	120	120	.....		100	1,000,000	7 cum	7 Q.	Nov., 1905
General Electric	179½	178	−1½	May 8	100	48,256,050	8	8 Q.	Jan., 1906
International Pump	28	35	+7	June 5	100	12,262,500		2	July, 1905
International Pump preferred	80½	85¾	+5¼		100	8,850,000	6 cum	6 Q.	Feb., 1906
Lackawanna Steel	81	81	.....	March 14	100	34,971,400		.....	
Lake Superior Corporation	20	22¾	+2¾	Oct. 3	100	40,000,000		.....	
Niles-Bement-Pond	121	121	.....	Feb. 7	100	5,000,000	6	6 Q.	Dec., 1905
Niles-Bement-Pond preferred	103⅝	103⅝	.....		100	2,000,000	6 cum	6 Q.	Nov., 1905
Otis Elevator Co	57	59	+2	March 19	100	6,350,300		2 A.	Apr., 1905
Otis Elevator Co. preferred	106	106	.....		100	5,589,500	6 n. c.	6 Q.	Jan., 1906
Pittsburg Coal Co	14⅞	16⅞	+2	Feb. 12	100	30,135,000		.....	
Pittsburg Coal preferred	59	61½	+2½		100	30,716,200	7	.....	Apr., 1905
Pressed Steel Car	57	62½	+5⅝	Feb. 21	100	12,500,000		3	Aug., 1904
Pressed Steel Car preferred	100⅞	103⅝	+2¾		100	12,500,000	7 n. c.	7 Q.	Nov., 1906
Pullman Palace Car	244	243	−1	Oct. 18	100	74,000,000		8 Q.	Feb., 1905
Railway Steel Spring	60½	61	+ ⅝	March 1	100	13,500,000		4 S. A.	Oct., 1905
Railway Steel Spring preferred	104	105¼	+1¼		100	13,500,000	7 cum	7 Q.	Dec., 1905
Republic Iron & Steel	37¼	36½	− ¾	Oct. 17	100	27,352,000		.....	
Republic Iron & Steel preferred	107⅛	108	+ ⅞		100	20,852,000	7 cum	7 Q.	Jan., 1906
Sloss-Sheffield	93	93	.....	March 14	100	7,500,000	5	5	Jan., 1906
Sloss Sheffield preferred	105	106	+1		100	6,700,000	7 n. c.	7 Q.	Jan., 1906
Tennessee Coal & Iron	160	159	−1	May 15	100	22,552,800		4 Q.	Jan., 1906
U. S. Cast Iron Pipe & Foundry	51⅝	52⅛	+ ½	June 27	100	12,500,000		2	Jan., 1906
U. S. Cast Iron Pipe & Foundry preferred	96	96⅜	+ ⅜		100	12,500,000	7 n. c.	7	Feb., 1906
U. S. Steel	44½	46	+1½	April 16	100	508,302,500		.....	Dec., 1903
U. S. Steel preferred	108¼	112⅝	+4⅜		100	360,281,100	7 cum	7 Q.	Nov., 1905
U. S. Steel 5's	98	99⅝	+1⅝		100	463,798,000	5	5 A.	
Virginia Iron, Coal & Coke	53⅜	54¾	+ ⅞	Sept. 18	100	8,641,600		.....	
Westinghouse Electric	174½	173	−1⅛	June 27	50	20,996,350	10	10 Q.	Jan., 1905
Westinghouse Air Brake	150	150	.....	Oct. 2	50	10,990,450	20	20 Q.	Jan., 1900

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Star Manufacturing Co., Milwaukee, has been incorporated to conduct a general manufacturing and foundry business with a capital stock of $50,000. The incorporators are: Joseph Scobis, Howland Russel and Henry Ferge.

The L. Best Co., Manhattan, N. Y., has been incorporated with $20,000 capital stock to manufacture emery and corundum wheels, etc. The incorporators are: Clara Best, Glen Ridge, N. J.; Charles Hasselmeyer and Carrie Clum, Brooklyn, N. Y.

The Cement Post and Pile Co., Orangeburg, Rockland County, N. Y., has been incorporated with $200,000 capital stock. The directors are: Warren B. Hutchinson, William H. Canfield, both of New York; and G. A. Le Fevre, of Orangeburg.

The National Metal-Fabric Co., New York, has been incorporated to manufacture steel and iron and their products with $15,000 capital stock. The incorporators are: Harry McCallum, 852 St. Nicholas avenue, New York; George L. Curtiss, same address; Norris E. Clark, Dwight G. Clark, Plainville, Conn;. Thomas B. Heimes and John W. Eshleman, Mt. Joy, Pa.

Stransky & Co., New York, have incorporated for the purposes of mining, casting, plating, etc. The capital stock is $500,000. The incorporators are: Maurice Stransky, 300 West 106th street; Jacob Strand, 310 West 83rd street, both of New York; and William L. Faulk, 765 Jefferson avenue, Brooklyn, N. Y.

The Bonney-Vehslage Tool Co., 134 Coit street, Irvington, N. J., has been incorporated to manufacture tools and hardwood specialties with a capital of $20,000. The incorporators are: Chas. S. Bonney, Ernest C. Vehslage, both of Irvington, N. J.; Arthur L. Fullman, 2,384 Seventh avenue, New York.

The Burnham Railway Appliance Co., Boston, Mass., has been incorporated to deal in railway appliances, etc., with a capitalization of $50,000. A. Burnham, 89 State street, Boston, is the treasurer and clerk.

The Barnet Drop Forging Co., East Hampton, Mass., has been incorporated to deal in forgings with a capital of $50,000. The president is A. P. Wellman, Philadelphia; and treasurer, H. E. Barnet, East Hampton.

The Westergaard Machinery Co., Valley City, N. D., has been incorporated with a capital stock of $25,000 by W. J. Westergaard, C. R. Swanson, J. S. Molstad, Valley City, N. D.

The Gilleland Car & Foundry Co., St. Louis, Mo., has been incorporated with a capital stock of $5,000,000 with the following directors: Edgar B. Gilleland, and E. M. Markel, St. Louis; E. M. Markel Jr., Des Moines, Iowa; J. S. Faogerty and E. M. Markel, Arkansas City, Kan.; George H. Willis and J. Giles Smith, Wichita, Kan.; F. B. Gilleland, Crescent, A. J. Biddison, Pawnee, and William A. Knowles, Guthrie, Okla.

The United Iron & Steel Co., St. Louis, Mo., has been incorporated with a capital stock of $50,000 by Sam Baskowitz, Joseph Greenspon, Ben Koplar and Saul Levitt.

The Badger Iron Co., Grand Rapids, Mich., has been incorporated with $250,000 capital stock for the purpose of carrying on mining operations. The incorporators are: M. J. Clark, Frank Jewell, Arthur A. Scott, Cyrus E. Perkins and L. W. Wolcott.

The John C. Smith Hoe & Tool Co., Evansville, Ind., has been incorporated for $25,000 to make and sell hoes and edged tools. The incorporators are: John C. Smith, John F. Young and Joseph B. Henningford.

The Industrial Machine Works, New Orleans, has been incorporated for $50,000 by E. M. Loeb, Isidore Kohlmeyer, J. B. Strauss, Percy Stern and Charles Weinberger. It will manufacture and repair machinery and operate a brass and iron foundry.

The Greenwood Machine & Supply Co., Greenwood, Miss., has been chartered with a capitalization of $25,000.

The Miners' Foundry & Supply Co., Joplin, Mo., has been incorporated for $50,000 by H. C. Cole, president; Paul N. Davey, vice president; C. P. Wallace, secretary; and W. B. Kane, treasurer.

The Dyersburg Machine & Supply Co., Dyersburg, Tenn., has been chartered with a capital stock of $20,000 by F. N., W. W. and J. L. Shepard and associates.

The Sheffield Steel Range & Stove Co., Sheffield, Ala., has been incorporated with a capital stock of $50,000 to manufacture steel and cast ranges, cook stoves, heaters, grates, mantels, hollow ware, etc. The officers are John Donk Jr., president; S. B. McTyler, treasurer, and R. R. Hill, secretary and manager.

The Root Street Foundry Co., Chicago, has been incorporated with $15,000 capital stock by M. E. Herbert, John E. Hannan and John Wright.

The Wrought Iron Range Co., St. Louis, Mo., has been incorporated and the following officers elected: W. L. Culver, president; H. H. Culver, vice president; E. R. Culver, treasurer; and B. B. Culver, secretary.

The Hudson Mfg. Co., Oklahoma City, Okla., has been incorporated to take over the interests of the Hudson & Cook Co., manufacturers of steel tanks. The new firm will increase the capacity of the plant and its working force and will place salesmen in all nearby states. The incorporators are: Ben F. Hudson, Rockport, Tex.; Carlton Falkner, Waco, Tex.; Albert Kirkpatrick, McKinney, Tex. The company is capitalized at $100,000.

The Southwestern Mfg. Co., Portland, Me., has been incorporated for the purpose of manufacturing and dealing in forgings, machinery, tools, etc., with a capital stock of $10,000. The officers are: President, Miller W. Bladwin; and treasurer, James J. Hernan, both of Portland.

The Acme Handle Co., St. Louis, Mo., has been incorporated with $15,000 capital stock. The company will manufacture a complete line of axe, sledge, pick, hammer and hatchet handles. The company has purchased the plant of the Acme Handle Co., at Pierne, Ark., which will be largely increased under the direction of J. E. Duffield, factory manager.

The Michigan Copper & Brass Co., Detroit, Mich., has been incorporated with a capital stock of $1,000,000, to operate a copper and brass rolling mill. Among the incorporators are: M. J. Murphy, George H. Barbour, J. E. Dannaher and W. D. Carpenter.

Braunfels, Browning & Co., New York, incorporated with a capital stock of $100,000 will manufacture machinery, tools, etc. The incorporators are: G. Martin Braunfels, No. 237 East 24th street; Harvey Wynkoop, No. 224 Lexington avenue; and Gilbert Browning, No. 789 St. Nicholas avenue, all of New York.

The Great Lakes Wrecking Salvage & Development Co., Buffalo, N. Y., has been incorporated with a capital stock of $50,000 to carry on a wrecking salvage and dredging business. The incorporators are: David H. Andrews, Charles T. Clark and George C. Andrews, all of Buffalo, N. Y.

The Consolidated Manganese Mining Co., No. 164 Market street, Newark N. J., has been incorporated in New Jersey with a capital stock of $500,000 to develop the mining property known as the Llave manganese mine, the Bos-

ton mines and Isabella mines situated near Santiago, Cuba. The incorporators are: Walter P. Lindsley and Wm. H. Lushleor, of No. 164 and Henry C. Beach of No. 122 Market street, Newark, N. J.

The United States Smelting, Refining & Mining Co. has been incorporated under the laws of Maine with a capital stock of $75,000,000 to carry on mining operations. The incorporators are: President, C. A. Hight, Brookline, Mass.; treasurer, E. H. C. Ramsdell, Boston; clerk, L. L. Hight, Portland, Maine.

The Metals Manufacturing Co., of Nyack, N. Y., has been incorporated with a capital stock of $300,000 to manufacture metals and machinery. The incorporators are: William F. Hutchinson, Nyack, N. Y.; Willis A. Barnes and Warren B. Hutchinson, No. 141 Broadway, New York.

The Bolen Foundry & Manufacturing Co., New York, will manufacture brass finishings, brass goods, etc. The capital stock is $2,500 and the incorporators are: H. W. A. Lehnert, George J Rohmann and Andrew Lehnert, all of Brooklyn.

The Mechanical Manufacturing Co., No. 419 Market street, Camden, N. J., mechanical engineers, tool makers, brass founders and metal workers, has been incorporated with a capital stock of $100,000. The incorporators are E. L. Smith, E. E. Pennock and John A. McPeak, all of the address given.

New Construction:—

The Western Car & Foundry Co., Anniston, Ala., is gradually installing improvements and changes calculated to enlarge its output. The only large addition under way is the enlargement of the malleable iron foundry, providing larger floor space and a greater number of annealing ovens. The furnaces and other present equipment are adequate for the increasing requirements. The company is pursuing the policy of making its improvements so gradual in character as to be practically an evolution and not any special or radical changes.

Plans and estimates are being prepared by the Detroit, Toledo & Ironton Railroad for the building of new coal and ore docks at Toledo and their equipment with the most modern machinery. The work is expected to cost about $600,000; it will be begun early in the spring.

The Harvey Machine Co., Baltimore, has let the contract for an addition to its plant 80 x 100 feet to John Cowan.

The Price & Evans Foundry Co., Chattanooga, Tenn., is having plans drawn for the erection of a large plant in Highland Park, that city. When this is completed, the intention is to move the machinery from the present plant.

Herman Romunder, president of the Comfort Passenger Car Co., which until recently operated a plant in South Milwaukee, Wis., is said to be planning the erection of a new plant for the resumption of the business. The factory buildings under design will cost in the neighborhood of $40,000.

The Bartlett Steel Works are occupying their new plant at Joplin on the site of the buildings burned last September. In the rebuilding the plant was largely increased in size. Much of the machinery which went through the fire had to be replaced.

The Kahlenberg Bros. Machinery Co., Two Rivers, Wis., will erect a large machine shop for the construction of marine gasoline engines.

Drummond & Co. for their plant at Reading, Pa., have let the contract to George W. Beard & Co. for the erection within a short time of a rolling mill building 60 x 100 feet and a brick warehouse.

The Union Steam Pump Co., Battle Creek, Mich., is to add two buildings to its plant.

The Montreal Rolling Mills, Montreal, Canada, contemplates the erection of a butt-weld pipe mill with complete modern equipment, on the property which it acquired when it absorbed the Hodgson Iron & Tube Co.

The Irwin Auger Bit Co., Wilmington, O., will erect a two-story factory building 150 x 160 feet, the equipment for which will be transferred from the old plant.

The Lukens Iron & Steel Co., Coatesville, Pa., has commenced the construction of three 50-ton open-hearth furnaces. The company now has twelve furnaces running full capacity.

A site has been purchased on the Hocking Valley Railroad by the Capitol Lock-Nut & Washer Co., Columbus, O., upon which it is planning to erect a nut and bolt factory in the near future.

A. W. Brown, of the Brown Iron & Brass Works, Ogden, Utah, will commence conditions in his iron fence factory and machine shop in the near future. Ornamental iron work will be a particular feature of the new shop.

The Hydraulic Mfg. Co., recently incorporated at Seattle, Wash., will award the contracts in the near future for the erection of a $100,000 plant on a site recently purchased. The company will manufacture water and gas pipe, water tanks, all kinds of heavy steel material and supplies used in hydraulic mining. The officers of the company are: F. S. Lange, president; R. H. Campbell, vice president; Ira D. Campbell, secretary and consulting attorney; F. A. Hoffman, general manager; and E. P. Glatz, constructing engineer.

Fires:—

The four-story brick storage building of F. E. Meyers & Bro., Ashland, O., manufacturers of pumps and hay tools, was destroyed by fire Jan. 19. The loss will be heavy, though the flames were confined entirely to the storage department. Factory buildings and materials were saved and the operation of the shops was not suspended. Shipments will not be delayed more than a week.

Fire which presumably was started by sparks from a passing locomotive caused about $2,500 damage to the tinning department of the Toledo Metal Wheel Co., Toledo, O., Jan. 16.

The Walsh Brake Shoe & Fdy. Co., East Moline, Ill., has decided to rebuild the plant recently destroyed by fire.

The Ames Shovel & Tool Co., North Easton, Mass., suffered a loss of $40,000 by a severe fire in its handle shop Jan. 11.

The Washington Iron Works, Broadway and Pratt streets, Buffalo, N. Y., was damaged by fire to the extent of $7,500 on Jan. 14.

General Industrial Notes:—

Madison furnace, Rempel, Jackson County, O., is being dismantled. It was built in 1854-5 as a charcoal furnace and ran almost constantly until about 6 years ago. Recently it was leased from Clare, Duduit & Co., the owners, by the Wellston Iron & Steel Co. and was operated for a time with coal as fuel. Its stack was of native stone construction and it was one of the pioneer furnaces in the once famous iron district of southern Ohio.

The Friedley-Voshardt Co., Chicago, recently incorporated, takes over the business of Friedley & Voshardt in the manufacture of steel ceiling, architectural ornaments, steel tanks, and metal novelties. H. F. Voshardt is president, A. F. Friedley vice president and W. T. Kettering secretary. Additions to the plant include a building 25 x 125 feet, a tee 40 x 40 feet and an ell 75 x 75 feet.

At the recent annual meeting of the Brier Hill Iron & Coal Co., Youngstown, O., the vacancies in the directorate caused by the death during the past year of Henry Tod and William Tod were filled by the election of their sons, John Tod and David Tod. Geo. Tod was chosen president, J. G. Butler Jr., vice president and general manager succeeding the late Henry Tod, as vice

president, and H. H. Stambaugh was made secretary-treasurer. The company was established in 1858 by Governor Tod. Mr. Butler has long been general manager.

John Schwartz has purchased the interests of James Taylor in the Cheboygan Boiler Works, Cheboygan, Mich., and the operating firm will be known as MacGregor & Schwartz.

The Ralston Steel Car Co., Columbus, O., has elected the following directors: J. D. Ellison, C. A. Boardman, E. A. Cole, D. C. Beggs, E. N. Huggins, all of Columbus, and W. R. Mumford and J. S. Ralston of Chicago. Mr. Ralston is president, J. D. Ellison, vice president, and Willis G. Bowland secretary and treasurer. The plant is now turning out ten new cars per day besides its repair work and will shortly increase the output. A. Becker is general manager.

Exile Burkett, general manager of the Southern Engine & Boiler Works, states that there is no truth in the widely circulated report that the plant is to be moved from Jackson, Tenn., to Nashville.

Twenty-six ovens were started recently at the Redstone Township plant of the Republic Iron & Steel Co., in the Connellsville region.

The Fort Wayne Rolling Mill Co., recently organized with a capital of $35,000 has substantially the same stock holders as those of the bankrupt Fort Wayne Iron & Steel Co., whose plant it has acquired. All the proved indebtedness of the old company was assumed. E. F. Yarnelle and H. C. Rockhill, both of Fort Wayne, are respectively president and vice president and treasurer; M. Cook of Wabash, Ind., is secretary. C. H. Rawlins will have charge of the sales department and Charles A. Borts, of the Republic mill at Toledo, O., becomes superintendent Feb. 1.

W. A. Stone of Hopwood, Pa., recently purchased from the J. F. Husted heirs about 47 acres of coal lands in Fayette County, Pa., the consideration being $50,000. The intention is to work the coal from the plant of the Prospect Coal & Coke Co., of which Mr. Stone is president. The Prospect company has 40 coke ovens in operation and intends to build 60 additional.

The old Elmira Steel Works, Elmira, N. Y., which have been idle for some time, have been acquired by a company of which John Stengle is at the head, and will be operated. One of the two 20-ton basic open-hearth furnaces was started last week and the other will be put in commission at an early date.

Guy R. Johnson has bought one-half of the interest of Graham MacFarlane in the Red River Furnace Co., and will be in charge of the operation of the Helen furnace at Clarksville, Tenn. Mr. MacFarlane who is to act as consulting engineer on Southern coal and iron interests has bought the Dover and Bear Spring cold blast charcoal furnaces in Stewart county, Tenn., and the ore rights and wood reserves of the Cumberland River Land Co.

Robert S. Alter has been elected to the vacancy on the directory board of the American Tool Works Co., Cincinnati, caused by the death of R. J. Smith in a railway accident last August. The officers are: Franklin Alter president, J. B. Doan vice president and general manager, Henry Luers secretary and treasurer and A. R. Robinson general superintendent. The directors are Franklin Alter, Robert S. Alter, J. B. Doan, H. H. Peck and A. B. Voorhees.

The Youngstown Iron & Steel Roofing Co., Youngstown, O., manufacturer of iron and steel roofing, galvanized iron and steel sheets, sheet metal lath, corrugated metal lath, etc., elected the following at a directors' meeting held Jan. 12: C. A. Cochran, director, to succeed G. M. McKelvey, deceased; and John O. Pew, vice president, also succeeding Mr. McKelvey. Mr. Pew is also the general manager.

No. 2 blast furnace of the Dunbar Furnace Co., Dunbar, Pa., will probably be blown in about March 1. The new furnace will be equipped with a skip hoist and a new machine shop will be added later on. The daily output is estimated at 300 tons.

Trade Notes.

The Robins Conveying Belt Co., of New York, has opened an office in the Frick Bldg., Pittsburg, where the resident engineer, G. R. Delamater, will receive inquiries from that district for conveying and hoisting machinery.

The newly established sales agency of the Tennessee Coal, Iron & Railroad Co., in New York is located in the Hanover Bank Bldg., 5 Nassau street, with E. B. Blandy in charge.

The St. Paul Fdy. Co., St. Paul, furnished the structural iron for the jobbing house just completed for G. Sommers & Co. The contract involved about $20,000 worth of materials.

John F. Allen, 370-372 Gerard avenue, New York, has just made a shipment of two 72-inch Allen riveters to Japan the order for which was received through Mitsui & Co., New York.

Joseph T. Ryerson & Son, Chicago, report machinery business continuing good though inquiries are limited to single machines rather than to complete equipments as was the order of things a few months ago. The company draws particular attention to its air compressor business, orders having been booked in the last two weeks for one 650-foot machine for the Frank Prox Co., Terre Haute, Ind.; one 650-foot machine for the Skene Lead Co., Elizabeth, Ill.; one 250-foot machine for Kaestner & Co., Chicago, and a 325-foot machine for the Prescott Co., Menominee, Mich. Demand for iron working tools is also of good proportions, particularly for the smaller line of punches and rolls. The company has recently opened a new machinery store room in its building fronting on Lake street, in which power has been installed for the operation when necessary of the 30 or 40 different tools in stock.

The Sliding Blade Gear Co., 6126 Monroe avenue, Chicago, has been incorporated with $30,000 capital stock to manufacture a special slide cut shear. The incorporators are: Perry McMillen, P. E. Thomas and B. F. Moore.

Among the contracts recently secured by the McClintic-Marshall Construction Co., Pittsburg, is an order for 12,000 tons for bridge work for the Tidewater Railway, 6,000 tons in elevated work for the Chicago & Western Indiana Railway, 5,000 tons of structural steel for the Bethlehem Steel Corporation, a new foundry building for the Standard Steel Car Co., at Butler, Pa., and other smaller orders amounting in all to some 25,000 tons.

TRADE PUBLICATIONS.

The Library Bureau, Chicago, has issued a bulletin describing systems of transferring, together with transfer files and guides for use therewith.

The Warwood Tool Co., Wheeling, W. Va., has brought out a handsome pamphlet illustrating and describing its new plant. A number of full page illustrations of the interior and exterior of the shop are shown.

The Stiles-Morse Co., Chicago, recently brought out a booklet illustrating Bliss machinery, for which it is the selling agent in Chicago. The catalog lists different styles of drawing and punching presses, shears, drop hammers, etc.

The United Engineering & Foundry Co., Pittsburg, is distributing a booklet illustrating new machinery which it has recently built for iron and steel works. This includes plate mills, blooming mills, punches, shears, cold saws, rolls, etc.

The Allis-Chalmers Co., Milwaukee, in bulletin No. 1,048 illustrates and describes Bullock alternating current generators of the engine and flywheel types. The machines described are large size, ranging from 75 to 500 kilowatts in the engine type and from 425 to 5,000 in the flywheel type.